MALGOD: Models and Algorithms for Optimal Cost Management Systems Design
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The aim of this research project is to develop "Models and Algorithms for Optimal Cost Management Systems Design" (MALGOD).

Cost accounting and cost management research has been concerned with a set of aspects such as cost allocation, cost variance analysis, overhead and joint costs and product costing, which together should contribute for the design of better cost management systems for decision making. In general terms, cost accounting comprises "ex post" cost reporting and analysis, whereas cost management emphasises "ex ante" planning and control exercises (Geiger and Ittner, 1996). In this context, Activity Based Cost Management Systems (ABCM) represent a higher sophisticated approach for cost management than traditional systems.

Cost management systems assume a strategic relevance in many situations (e.g. complex organizations, services firms, public services, firms which need to compute transfer prices). On the other hand, generally, such systems are costly and demanding. In this context, the design and implementation of effective and efficient solutions is crucial. The question and the problem here is "how to measure the quality and appropriateness of a cost management system", or in different terms, "how to design optimal cost management systems"? Further, these questions can be extended to management accounting in general and/or to other management accounting practices.

Optimal cost management systems should not only produce accurate cost information but should also provide timely relevant information to managers, supporting a better use of resources and improving competitiveness in terms of costs, quality and profitability (Babad and Balachandran, 1993). Optimal cost management systems should have the main purpose of increasing value by ensuring an appropriate use of resources through timely information that permits effective and efficient decision making (Sprinkle, 2003). In this context, new cost management systems should be optimized in the design phase and existent systems should be assessed and monitored regularly in order to guarantee their appropriateness as instruments for decision making. Thus, the development of Models and Algorithms for Optimal Cost Management Systems Design (MALGOD) is a relevant issue.

Little attention has been given in the literature to the design of optimal cost management systems as well as to the theoretical conceptualization of such effort/strategy. In practice, the study of optimization strategies for a cost management system has been merely centred on the trade-off between the number of cost drivers and the cost of the information system, i.e. the trade-off accuracy against complexity (Babad and Balachandran, 1993; Homburg, 2001).

Thus, this research project formulates a set of objectives which can be summarized as follows:

(i) To define the characteristics of an "optimal cost management system" taking into account quantitative and qualitative aspects.

(ii) To develop objective functions which fully capture such characteristics.
(iii) To develop and test full mathematical models and solution methods (algorithms).
(iv) To apply the proposed models and algorithms to the design of new cost management systems and to assess the optimality level
of existent ones (the study will be centred on ABCM systems).
(v) To analyse, explain and interpret the implications of optimal and sub-optimal designs, aiming theoretical generalization.

In fact, a significant theoretical contribution is expected considering recent contributions made by the members of the research team (e.g. Cruz et al., 2009; Boland et al., 2008; Hopper and Major, 2007). The research methodology will include a literature review on cost management systems design and optimization techniques, the study of up to date optimization software, the collection of empirical data through case studies, the development of the quantitative models and, finally, the theoretical analysis and generalization of results and implications.

This research project intends to go much further than previous research on this domain by developing an effective approach for the design and assessment of optimal cost management systems.

The project will be conducted by a multidisciplinary research team, with academic background, experience and scientific contributions in Management accounting and Advanced cost management systems (ABCM) - Vieira (2008), Major and Hopper (2005); and Operations research and Mathematical optimization, in particular mathematical programming and genetic algorithms (Rocha e Fernandes, 2009; Costa et al., 2008; Alvelos e Carvalho, 2007a).