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## **IFAC's Conception of the Evolution of Management Accounting**

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### ***Abstract***

IFAC's Management Accounting Practice Statement Number 1, revised in 1998, is concerned with management accounting practices. This research note describes an operationalization of its conception of the evolution of management accounting. The paper is informed by experience in developing and applying an IFAC-based model to survey the stage of evolution of the management accounting practices in a United Kingdom industry sector. The model is intrinsically interesting and has the potential for replication in other contexts and in comparative cross-national, inter-industry or longitudinal studies.

**Key words:** IFAC, Management Accounting Evolution, Research Note

## **1. INTRODUCTION**

In 1989 the International Federation of Accountants<sup>1</sup> (IFAC) issued a statement summarizing its understanding of the scope and purposes of management accounting and the concepts which underpin it. The statement was revised and released in 1998 as *Management Accounting Concepts* - Number 1 in the series of International Management Accounting Practice Statements. Through its members (the national accountancy bodies of all major economies) IFAC represents "2.5 million accountants employed in public practice, industry and commerce, government, and academe"

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<sup>1</sup> "IFAC is the global organization for the accountancy profession. It works with its 163 member organizations in 119 countries to protect the public interest by encouraging high quality practices by the world's accountants." IFAC (2005)

(IFAC 2005), and the ‘flagship’ statement in its management accounting series therefore merits attention.

Statement 1 does not explicitly identify a central purpose but comprises an introduction and the following sections: Evolution and Change in Management Accounting (paras 7 - 20); Management Accounting and the Management Process (paras 21 - 36); The Conceptual Framework (paras 37 - 72), and Using the Conceptual Framework (paras 73 - 77). The Conclusion (para 78 - 79) contends that the statement can be used by managers "for understanding, evaluating and developing", by professional accountants in management for "focusing, benchmarking and developing", by educators "in refocusing and consolidating their efforts" and by professional associations "in reformulating and consolidating the work technologies to be associated with management accounting now and in the future." In this research note we concentrate on the first section, entitled Evolution and Change in Management Accounting.

Our purpose is to describe an operationalization of IFAC’s conception of the evolution of management accounting. The note is informed by our experience in developing and applying an IFAC-based model to survey the stage of evolution of the management accounting practices in food and drinks companies in the United Kingdom. We submit that our model, explained in Sections 4 and 5, is intrinsically interesting and has the potential for replication in other, wider, contexts.

During the 1980s Kaplan, in his review of *The Evolution of Management Accounting*, and with Johnson in the *Relevance Lost* book, leveled criticism at the management accounting practices of the day. Since then a number of innovative management accounting techniques<sup>2</sup> have been developed across a range of industries, and publicized internationally. These have been designed to support modern technologies and management processes and companies’ search for a competitive advantage to meet the challenge of global competition.

It has been argued (Otley, 1995; Kaplan and Atkinson, 1998; Hoque and Mia, 2001; Fullerton and McWatters, 2002; and Haldma and Laats, 2002) that the ‘new’ techniques have affected the whole process of management accounting (planning, controlling, decision-making, and communication) and have shifted its focus from a ‘simple’ or ‘naive’ role of cost determination and financial control, to a ‘sophisticated’ role of creating value through improved deployment of resources. In 2001 Ittner and Larcker claimed that “companies increasingly are integrating various [innovative] practices using a comprehensive ‘value-based management’ ... framework”. (p. 350)

This ‘received wisdom’ begs a number of questions. We recognize, but set to one side, the question of whether the term evolution, with its implication of progress, is an appropriate description of what may be (just) change.<sup>3</sup> Likewise, we are not concerned with philosophical issues such as the relationships between concepts (or more broadly, theory) and practices, or which is the ‘cart and which the horse?’ Our purpose is not to address such questions but rather to recognize that IFAC has a strong claim to formally ‘speak for’ management accounting and that its framework of

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<sup>2</sup> Such as activity based techniques, strategic management accounting and the balanced scorecard.

<sup>3</sup> As Bertrand Russell wrote: " Change is one thing, progress is another". (1976, 19)

evolution can be useful in studies aiming to answer questions such as: To what extent are the practices advocated by academics, textbooks and professional institutes actually applied in organizations? At what stage of evolution is the management accounting of particular organizations, industries or countries?

Elsewhere (X and Y, 2006), in the full report of our empirical findings we provide an description of the management accounting practices of companies in a specific industry and located their levels of evolution on the IFAC spectrum. That sort of positivistic study is encouraged by, for instance, Ittner and Larcker who stress that “[i]t is difficult to imagine how research in an applied discipline such as management accounting could evolve without the benefit of detailed examination of actual practice” (2002, 788). This research note describes how our research approach (being IFAC-based) has wider relevance and how it can be applied in other contexts.

## **2. IFAC’S CONCEPTION OF MANAGEMENT ACCOUNTING EVOLUTION**

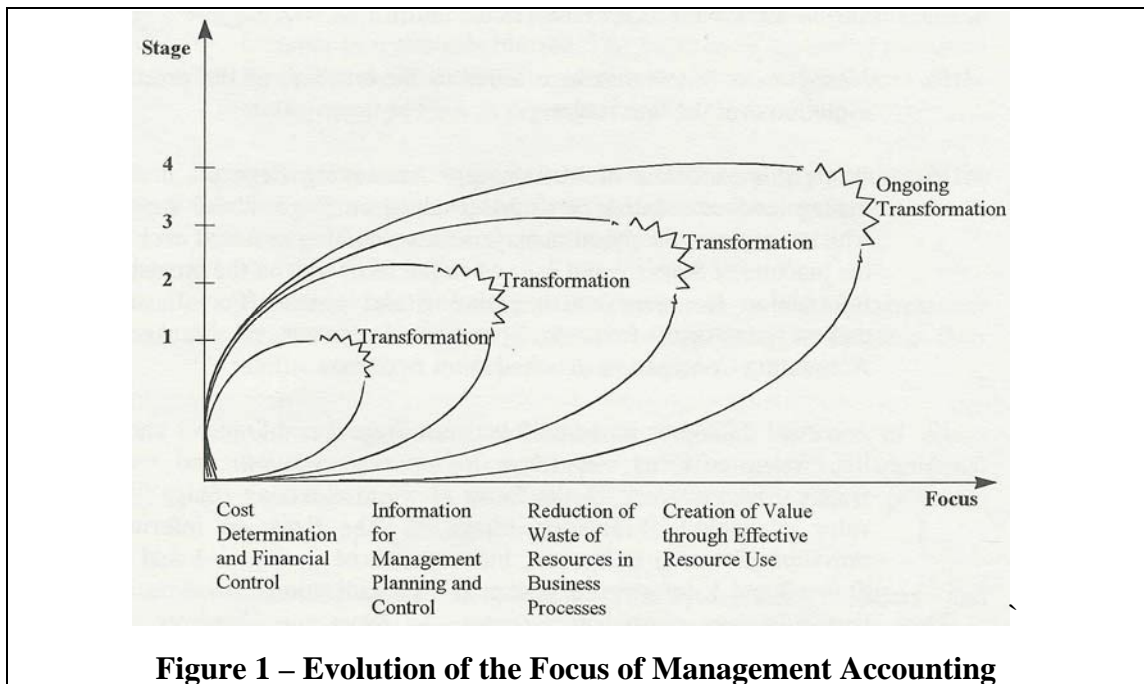
Although the IFAC (1998) framework is focused on concepts rather than practices, there is some lack of clarity about this. For instance, para 19 describes "the way in which management accounting as a field of activity is positioned within organizations"; it seems that those who drafted the statement view concepts merely as derivatives of practices. Another *caveat*, recognized by the statement, is that the scope, role, and organizational positioning of management accounting differ across organizations, cultures and countries. This problem is compounded (unless one believes that concepts are in vogue at the same time throughout the world) by the identification, in the Statement, of evolutionary stages with dates in history. An attempt is made to clarify this by referring to "leading edge practice internationally" (para 3), presumably (in this context) meaning leading edge conceptual practice! Nevertheless, despite its limitations (consideration of which is beyond the scope of this research note) the framework provides an interesting view of history and a useful set of parameters. The four stages of evolution identified by IFAC (1998) are shown in Figure 1 and described below. It should be pointed out that the stages are not mutually exclusive; each successive stage encompasses the concepts of the previous stage, and incorporates additional ones that arose out of a new set of conditions.

### **Stage 1 - cost determination and financial control (pre 1950)**

IFAC describes management accounting before 1950 as "a *technical* activity necessary for the pursuit of organizational objectives" (para 19). Its focus was mainly oriented towards the determination of product cost. Production technology was relatively simple, with products going through a series of distinct processes. Labor and material costs were easily identifiable and the manufacturing processes were mainly governed by the speed of manual operations. Hence, direct labor provided a natural basis for assigning overheads to individual products. The focus on product costs was supplemented by budgets and the financial control of production processes.

The strong position held by Western countries in international markets made their products highly regarded. They could be sold relatively easily, and competition on the basis of either price or quality was relatively low. There was little innovation in products or production processes as existing products sold well and the production processes were well understood. Accordingly, management was concerned primarily with internal matters, especially production capacity. The use of budgeting and cost accounting technologies was prevalent in this period. However, the dissemination of

cost information tended to be slight, and its use for management decision-making poorly exploited (Ashton et al., 1995).



Source: IFAC (1998)

### **Stage 2 - information for management planning and control (by 1965)**

In the 1950s and 1960s the focus of management accounting is seen to have shifted to the provision of information for planning and control purposes. In Stage 2 management accounting is described by IFAC as "a *management* activity, but in a *staff* role" (para 19). It involved *staff* support to *line* management through the use of such technologies as decision analysis and responsibility accounting. Management controls were oriented towards manufacturing and internal administration rather than strategic and environmental considerations. Management accounting, as part of a management control system, tended to be reactive, identifying problems and actions only when deviations from the business plan took place (Ashton et al., 1995).

### **Stage 3 - reduction of resource waste in business processes (by 1985)**

The world recession in the 1970s following the oil price shock and the increased global competition in the early 1980s threatened the Western established markets. Increased competition was accompanied and underpinned by rapid technological development which affected many aspects of the industrial sector. The use, for example, of robotics and computer-controlled processes improved quality and, in many cases, reduced costs. Also developments in computers, especially the emergence of personal computers, markedly changed the nature and amount of data which could be accessed by managers. Thus the design, maintenance and interpretation of information systems became of considerable importance in effective management (Ashton et al., 1995).

The challenge of meeting global competition was addressed by introducing new management and production techniques, and at the same time controlling costs, often

through "reduction of waste in resources used in business processes" (IFAC, 1998, para 7). In many instances this was supported by employee empowerment. In this environment there is a need for management information, and decision making, to be diffused throughout the organization. The challenge for management accountants, as the primary providers of this information, is to ensure through the use of process analysis and cost management technologies that appropriate information is available to support managers and employees at all levels.

#### **Stage 4 - creation of value through effective resources use (by 1995)**

In the 1990s world-wide industry continued to face considerable uncertainty and unprecedented advances in manufacturing and information-processing technologies (Ashton et al., 1995). For example the development of the world-wide web and associated technologies led to the appearance of E-commerce. This further increased and emphasized the challenge of global competition. The focus of management accountants shifted to the generation or creation of value through the effective use of resources. This was to be achieved through the "use of technologies which examine the drivers of customer value, shareholder value, and organizational innovation" (IFAC, 1998, para 7).

A critical difference between Stage 2 and Stages 3 and 4 is the change in focus away from information provision and towards resource management, in the form of waste reduction (Stage 3) and value creation (Stage 4). However, the focus on information provision in Stage 2 is not lost, but is re-figured in Stages 3 and 4. Information becomes a resource, along with other organizational resources; there is a clearer focus on reducing waste (in both real and financial terms) and on leveraging resources for value creation. Accordingly, management accounting is seen in Stages 3 and 4 as "an integral part of the management process, as real time information becomes available to management directly and as the distinction between staff and line management becomes blurred." (IFAC, 1998, para 19) The use of resources (including information) to create value is seen to be an integral part of the management process in contemporary organizations.

### **3. RESEARCH ORIENTATION AND DATA**

A significant body of empirical research has been published in the field of management accounting practices. For example, Chenhall and Langfield-Smith (1998), Ghosh and Chan (1997), Guilding, Lamminmaki, and Drury, (1998), Luther and Longden (2001), Wijewardena and Zoysa (1999), Mendoza and Bescos (2002), Yohikawa (1994) and Drury et al. (1993). These studies report on the use of various management accounting techniques in different countries<sup>4</sup>. Our study was informed by that tradition. However, it differed in looking at a broad set of management accounting practices (budgeting, performance evaluation, costing, decision-making, communication and strategic analysis) and doing so within the IFAC framework described above. It was a response to the call for research with "greater understanding of both individual practices and macroscopic relationships among practices ... we found very little of the latter in the extant literature" (Anderson and Lanen, 1999, 408-9).

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<sup>4</sup> For a review of empirical management accounting in North America, see Ittner and Larcker (2001) and Shields (1997), and within European countries see Bhimani (2002).

A postal questionnaire was the principal source of empirical data<sup>5</sup>. The criteria used in selecting companies for inclusion in the sample were: a SIC UK industry code of '15' (manufacture of food products and beverages)<sup>6</sup>, employment of at least 30 people, and being active and independent companies. Management accountants in 650 companies were asked to indicate the frequency of use of 38 management accounting practices (MAPs) using a five point Likert-type scale (1 indicating *never* and 5 indicating *very often*). Completed questionnaires were received from 121 companies. A limitation of surveys is that questions may lack specificity and to overcome this and ensure consistency of responses, each MAP was briefly explained. Respondents were also asked to rate the importance of each technique/practice using either '*not important*', '*moderately important*' or '*important*'. The 38 MAPs, which had been derived from the literature, relate to costing systems, budgeting, performance evaluation, information for decision making, and strategic analysis.

#### 4. INNOVATIONS IN DATA ANALYSIS AND INTERPRETATION

Our purpose was to apply the IFAC framework to investigate the sophistication level of management accounting in the sample industry. Increased sophistication is manifested by a move along the spectrum from cost determination and financial control at one extreme to value creation at the other. Our questionnaire sought respondents' opinions on the perceived value of both traditional and 'newer' management accounting techniques and the extent to which they are used.

To measure the sophistication level it was necessary to extend IFAC's four stage management accounting evolution framework. Although the framework describes some broad characteristics of each stage, it does not provide illustrations of specific management accounting practices (MAPs) related to particular stages of evolution. In order to do this we had to, first, 'flesh out' the nature of each stage. This was done by supplementing the text of IFAC (1998) with insights from wider literature on the development of management accounting (e.g. Kaplan, 1984; Scapens, 1991; Ferrara, 1995; Allott, 2000; Allott et. al., 2001; Birkett and Poullaos, 2001; Garrison, Noreen and Seal, 2003). From this we were able to summarize the characteristics of each stage across the following four main dimensions:

- the approximate period in history with which each stage is principally associated,
- the typical organizational positioning, or location, of management accounting at that stage,
- the principal role of management accounting, and, finally,
- the main focus of management accounting's attention.

Table 1 shows our understanding of the characteristics of management accounting systems in each stage of evolution.

Armed with these characteristics we then used our judgement, informed by the literature and consultations with colleagues and participants at conferences<sup>7</sup>, to

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<sup>5</sup> In addition, face-to-face interviews were carried out to refine the questionnaire *ex ante* and to check the reliability of the survey results *ex post* and seek further explanation of some of the responses.

<sup>6</sup> It is the largest industry sector in the UK; Mann et al. (1999b) indicate that it provides employment for over three million people from primary producers to manufacturers and retailers, and it accounts for 9% of gross domestic product. Despite this the sector is under-researched in the management accounting field.

<sup>7</sup> Early drafts of the paper were presented at several workshops and conferences.

classify each of 38 MAPs into a stage of the evolution. Classification against four criteria was an interesting process which inevitably required some compromise so we accept that the positionings are not unambiguous and, in some cases, are anachronistic. Nevertheless, the internal consistency of MAPs included in each stage was confirmed by Cronback's alpha<sup>8</sup> tests applied to our data. It should be remembered that, as shown in Figure 1, each stage of evolution encompasses the practices in the previous stage in addition to the new set; for example, Stage 2 includes all MAPs included in Stage 1 as well as those arising at Stage 2. Table 2 shows the outcome of our classification of practices into each stage. The descriptive statistics of 'importance' and 'usage' and a statistic we describe as 'emphasis' (being the product of 'usage' and 'importance'), derived from our data, are included to help the illustration.

Again for the purposes of illustration, it is helpful to look at the extreme positions apparent from Table 2. Four management accounting practices were found to be indisputably widely used and important (Those with mean 'emphasis' values, across the whole sample, above 10 - out of a possible 15). Two in the category relating to cost determination and financial control are *Budgeting for controlling costs* and *Performance evaluation based on financial measures*. The other two relate to provision of information for planning and control and are *Budgeting for planning* and *Product profitability analysis*. At the other end of the scale, are six well known practices that (with mean emphasis values below three) may be dismissed as peripheral. They are two 'operations research type' practices - *Regression and Learning curve techniques*, and *Risk evaluation with probabilities and simulation* - and four more modern techniques that are associated with 'strategic management accounting' i.e. the analysis of *Economic value*, *Shareholder value*, *Industry analysis*, and *Product life-cycles*. This basic 'high-low' snapshot provides a strong indication that traditional management accounting seems 'alive and well'. The observation was supported by the means, by category, of the values reported for individual practices; these are shown in Table 3 below. It can be seen that the mean values for practices in categories CDFC and IPC are noticeably higher than those for less traditional categories RWR and CV<sup>9</sup>.

The next level of our analysis was the compilation of two lists with all 38 practices ranked in order of perceived importance and usage respectively. From this we were able to identify those practices which are placed significantly<sup>10</sup> differently. On the assumption that, over time, the ranking of usage will, in many cases, move towards

<sup>8</sup> Cronback's Alpha tests of internal consistency of MAPs, shown below, confirmed that the alphas for each stage had an acceptable level of reliability.

	Theoretical range		Actual range		Mean	Std. dev.	Alpha
	Min	Max	Min	Max			
Cost determination & financial control	1	15	1.75	15.00	8.467	2.957	.6349
Management planning & control	1	15	1.27	12.50	7.366	2.362	.7697
Reduction of waste in business resources	1	15	1.00	8.57	3.772	1.941	.6954
Value creation through effective resource use	1	15	1.21	11.14	5.137	2.178	.7890

<sup>9</sup> For elucidation of these acronyms see Figure 2.

<sup>10</sup> Those in which the ranking of importance is three or more places different from the ranking of usage.

the ranking of importance, our interpretation is that practices ranked markedly higher in terms of 'importance' than 'usage' are likely to become more widespread and *vice versa*. On this basis we made the predictions shown in Table 4.

It can be seen that the data in Table 4 show that the practices with higher ranking of usage than importance dominated the more traditional 'Cost determination and financial control' (CDFC) and 'Information for planning and control' (IPC) categories. By contrast the practices showing markedly higher importance than usage dominated the 'younger' categories 'Reduction of waste' (RWR) and 'Creation of value' (CV).

The ultimate aim of our research was to arrive at a summary assessment of the state of evolution of a particular industry's management accounting. To this end, it was necessary to classify each respondent firm into one of the four stages of evolution. For each firm, an average composite score was calculated (based on the *emphasis* - importance  $\times$  usage - indicated by respondents) across the MAPs grouped together by our categorization of practices shown in Table 2. Thus every firm had an average emphasis score for the four categories (predictor variables): CDFC, IPC, RWR and VC.

Cluster analysis was then applied. Cluster analysis is a statistical technique which classifies a large set of objects (people, firms, etc.) into distinct subgroups based on predictor variables. If the cluster analysis is successful it should produce homogenous groups with respect to the group's scores on the predictor variables (Coolidge, 2000). The hierarchical agglomerate method was used to combine firms into four clusters, thereby permitting us to consider each cluster as representing a stage of evolution. Ward's method was used to measure the distance between each combination of two sub-groups. This is commonly used to form clusters based on the squared Euclidean distance measure. First, the means for all predictor variables are calculated. Then, for each case, the squared Euclidean distance to the cluster means is calculated. These distances are summed for all of the cases. At each step, the two clusters that merge are those that result in the smallest increase in the overall sum of the squared within-cluster distances (Norusis, 1994).

The output of the clustering procedures was that 30 firms were categorized in Cluster A, 21 in Cluster B, 47 in Cluster C and 15 in Cluster D. The mean scores of variables within each cluster are presented in Table 5, with *F*-tests for each clustering variable.<sup>11,12</sup>

Having established the theoretical validity of the cluster analysis, the next step involved labeling the clusters on the basis of our interpretation of the shared characteristics of its components. This was done by matching the clusters to related stages of evolution (Stage 1, Stage 2 etc.). According to IFAC's theoretical conception of management accounting evolution, companies in Stage 1 have more

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<sup>11</sup> The *p* values of the *F*-tests indicate that statistical differences exist for individual variables across clusters, but do not indicate that statistical differences exist between pairs of clusters.

<sup>12</sup> To validate the cluster analysis, we performed multiple discriminant analysis on the four sets of composite management accounting practices (CDFC, IPC, RWR and VC) and the classification derived from cluster analysis. The results show that the four variables played significant roles in correctly classifying 95.5% of the firms into their respective groups. More specifically, 95.2%, 93.5%, 100% and 93.3% of companies were correctly classified into clusters A, B, C and D.



emphasis on CDFC (cost determination and financial control) practices and less emphasis on the practices in other sets (i.e. those relating to IPC, RWR and CV). Companies in Stage 2 place emphasis on practices in both CDFC (cost determination and financial control) and in IPC (provision of information for management planning and control) and less emphasis on practices in the other two sets (RWR and CV). Companies in Stage 3 have emphasis on CDFC (cost determination and financial control), IPC (provision of information for management planning and control) and RWR (reduction of waste in business resources) and less emphasis on the fourth set CV (Creation of value through effective resources use). Finally, companies in Stage 4 have more emphasis on all four sets of CDFC, IPC, RWR and CV.

An inspection of the mean scores of CDFC, IPC, RWR and CV in Table 5 provides bases for preliminary labeling of the empirically derived clusters. Mean scores of firms in Cluster B are the lowest for all sets (CDFC, IPC, RWR and CV) – this suggests that Cluster B represents Stage 1 of the evolution of management accounting. Companies in Cluster C have higher mean scores for all of CDFC, IPC, RWR and CV than those of Cluster B. Thus, Cluster C can represent Stage 2 of the management accounting evolution.

Clusters A and Cluster D have higher mean scores for all sets of CDFC, IPC, RWR and CV than those of Clusters B and C. Also, mean scores of CV in both Clusters C and D are higher than those of RWR. Because the mean scores of all four sets of CDFC, IPC, RWR and CV in Cluster D are higher than those in Cluster A, we have considered that Cluster D best represents Stage 4. Thus, Cluster A represents Stage 3.

The data in Table 5 allowed us to conclude that of the 113 firms, 19% (21) are in Stage 1, 41% (47 firms) are in Stage 2, 27% (30) are in Stage 3 and 13% (15) are in Stage 4 of management accounting evolution. About 40% of firms have management accounting systems in either Stage 3 or Stage 4 of IFAC's evolution.

## **5. SUMMARY**

The aim of this research note was to describe an application of the IFAC framework of the evolution of management accounting to a particular industry sector. In this note we have highlighted the following issues and research approaches:

- The IFAC framework has authority by virtue of the massive constituency that IFAC represents. Furthermore the framework is cited in academic and professional journals (e.g. Ittner and Larcker, 2001; Birkett and Poullaos, 2001; Sharman, 2003) and is being applied in programs such as the Malaysian National Awards for Management Accounting Best Practice (Abd Rahman et al, 2005). There is also a suggestion<sup>13</sup>, following IFAC's competency profiles pronouncement (IFAC, 2002), that it is the appropriate basis for assessing the practical experience of the Canadian Certified General accountants.
- In Tables 1 and 2 we have 'fleshed out' and operationalized the IFAC framework by classifying individual management accounting practices into one of four developmental stages. This provides a template useful for other empirical

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<sup>13</sup> [www.caaa.ca/faculty\\_development/practice/comptencyreport.html](http://www.caaa.ca/faculty_development/practice/comptencyreport.html)

researchers, or the basis for academic dispute by theorists with alternative classifications.

- By multiplying scores of importance and usage we derive a composite statistic of ‘emphasis’ on each practice. As an absolute measure emphasis is not especially meaningful. It does, however, provide useful supplementary information since for a practice to score highly, it is necessary for it to be both considered *important* and also *often* used. These are the practices that need to be particularly well documented by researchers and understood by aspirant practitioners.
- By identifying practices where perceived importance is significantly higher (or lower) than the present level of usage we suggest a basis for indicating which accounting practices will become increasingly used and those that will gradually be phased out.
- We provide an illustration of the application of cluster analysis to group firms according to their scores on the four stages of management accounting sophistication. This allowed us, in the underlying empirical study, to come to a conclusion as to the location of our sample on the IFAC spectrum of evolution.

We submit that our overall approach, and individual components, could be usefully applied in other contexts and in comparative cross-national, inter-industry or longitudinal studies.

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**Table 1 – Characteristics of Management Accounting Practices in Four Stages of Evolution**

	<b>Stage 1: Cost Determination and Financial Control</b>	<b>Stage 2: Provision of Information for Management Planning &amp; Control</b>	<b>Stage 3: Reduction of Waste in Business Resources</b>	<b>Stage 4: Creation of Value Through Effective Resources Use</b>
<i>Representative period:</i>	Prior to 1950	1950 - 1964	1965 - 1984	1985 to date
<i>Where positioned in organization:</i>	Similar to company secretarial.	A ‘staff’ management activity	Management accounting an integral part of management. ‘owned’ by all managers as the distinction between ‘staff’ and ‘line’ management becomes blurred.	
<i>Role:</i>	A necessary technical activity in ‘running’ an organization.	Providing info to support ‘line’ management’s operations.	Managing resources (including information) to ‘directly’ enhance profits by bearing down on inputs.	Directly enhance outputs and add value through strategy of ‘leveraging’ resources (especially information).
<i>Main Focus:</i>	Cost determination & controlling expenditure.	Information for management planning, control and decision-making. Including basic model building.	Reduction of waste/loss in business resources through process analysis and cost management technologies.	Creation of value through using resources effectively to drive customer value, shareholder value and innovation.

**Table 2 – Classification and Descriptive Statistics of Management Accounting Practices in the UK Food and Drinks Industry.**

	Importance <sup>a</sup>		Usage <sup>b</sup>		Emphasis <sup>c</sup>	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
<b>Stage 1. Cost Determination and Financial Control (CDFC)</b>						
Using a plant-wide overhead rate	1.61	0.76	2.12	1.42	4.34	4.54
Budgeting for controlling costs	2.66	0.62	4.12	1.05	11.25	4.28
Flexible budgeting	2.05	0.78	2.70	1.40	6.32	4.82
Performance evaluation based on financial measures	2.71	0.59	4.08	1.20	11.43	4.42
Evaluation of major capital investments based on payback period and/or accounting rate of return.	2.32	0.73	3.24	1.32	8.16	4.79
<b>Stage 2. Provision of Information for Management Planning and Control (IPC)</b>						
A separation is made between variable/incremental costs and fixed/non-incremental costs	2.32	0.74	3.30	1.27	8.43	4.73
Using departmental overhead rates	1.67	0.74	2.12	1.30	4.36	4.03
Using regression and/or learning curve techniques	1.17	0.45	1.24	0.61	1.64	1.83
Budgeting for planning	2.68	0.63	4.33	0.91	11.88	4.05
Budgeting with ‘what if analysis’	2.15	0.71	2.88	1.17	6.94	4.26
Budgeting for long-term (strategic) plans.	2.33	0.75	3.05	1.25	7.76	4.45
Performance evaluation based on non-financial measures related to operations	2.16	0.78	2.97	1.40	7.33	4.98
Cost-volume-profit analysis for major products.	2.36	0.72	3.14	1.26	8.17	4.63
Product profitability analysis.	2.69	0.54	3.90	1.07	10.91	4.04
Stock control models	2.16	0.74	2.83	1.26	6.69	4.40
Evaluation of major capital investments based on discounted cash flow method(s)	1.92	0.77	2.32	1.31	5.27	4.47
Long-range forecasting	2.33	0.69	3.17	1.28	8.00	4.64
<b>Stage 3. Reduction of Waste in Business Resources (RWR)</b>						
Activity-based costing	1.57	0.69	1.83	1.14	3.45	3.60
Activity-based budgeting	1.81	0.73	2.34	1.33	4.87	4.24
Cost of quality	1.73	0.70	2.05	1.16	4.18	3.70
Zero-based budgeting	1.54	0.70	1.99	1.28	3.82	4.15
Performance evaluation based on non-financial measure(s) related to employees	1.75	0.64	2.09	1.13	4.27	3.61

	Importance <sup>a</sup>		Usage <sup>b</sup>		Emphasis <sup>c</sup>	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
	Evaluating the risk of major capital investment projects by using probability analysis or computer simulation.	1.37	0.59	1.48	0.93	2.50
Performing sensitivity ‘what if’ analysis when evaluating major capital investment projects.	1.87	0.73	2.38	1.28	5.29	4.38

#### Stage 4. Creation of Value Creation through Effective Use of Resources (CV)

Target costing	1.79	0.77	2.36	1.39	5.19	4.71
Performance evaluation based on non-financial measure(s) related to customers	2.32	0.71	3.04	1.33	7.63	4.68
Performance evaluation based on residual income or economic value added	1.43	0.62	1.63	1.03	2.80	3.21
Benchmarking	1.65	0.64	1.97	1.08	3.81	3.26
Customer profitability analysis.	2.53	0.65	3.46	1.27	9.28	4.64
For the evaluation of major capital investments, non-financial aspects are documented and reported.	2.19	0.72	2.94	1.23	7.21	4.44
Calculation and use of cost of capital in discounting cash flow for major capital investment evaluation.	1.75	0.74	2.10	1.21	4.44	4.00
Shareholder value analysis	1.32	0.59	1.50	0.88	2.40	2.81
Industry analysis	1.41	0.61	1.65	1.14	2.89	3.43
Analysis of competitive position	2.19	0.75	2.89	1.19	7.03	4.28
Value chain analysis	1.69	0.79	2.10	1.38	4.51	4.70
Product life cycle analysis	1.46	0.66	1.65	0.93	2.87	2.92
The possibilities of integration with suppliers’ and/or customers’ value chains	1.68	0.74	2.08	1.17	4.21	3.89
Analysis of competitors’ strengths and weaknesses.	2.17	0.69	2.66	1.06	6.23	3.61

<sup>a</sup> Based on 3-point scale (1 = not important, 2 = moderately important, 3 = important).

<sup>b</sup> Based on 5-point scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = very often).

<sup>c</sup> The means of the emphases (usage × importance) for each firm - not the product of the mean usage and the mean importance. Surprisingly, perhaps, this would give different figures.

**Table 3 – Mean Values of Importance and Usage of Management Accounting Practices**

	Importance of MAPs (scale 1-3)	Usage of MAPs (scale 1-5)
Stage 1 practices. Cost determination & financial control	2.27	3.25
Stage 2 practices. Information for planning & control	2.16	2.94
Stage 3 practices. Reduction of waste of resources	1.66	2.02
Stage 4 practices. Creation of value	1.83	2.29

**Table 4 – Prediction of the Usage of Management Accounting Practices**

	Practices that will be phased out	Practices that will be increasingly adopted
<b>CDFC</b>	Plant-wide overhead rates	
<b>IPC</b>	Separation between fixed and variable costs Departmental overhead rates Non-financial measures related to operations	Cost-volume-profit analysis for major products Investment appraisal using DCF
<b>RWR</b>		Info concerning cost of quality Non-financial measures related to employees
<b>CV</b>		Analysis of competitors' strengths and weaknesses

**Table 5 – Classification of Companies Using Hierarchical Cluster Analysis**

	Clusters*				<i>F</i> -test	<i>P</i>
	<b>A</b> ( <i>n</i> = 30)	<b>B</b> ( <i>n</i> = 21)	<b>C</b> ( <i>n</i> = 47)	<b>D</b> ( <i>n</i> = 15)		
Number of firms in each cluster						
<b>CDFC</b>	9.74 (2.11)	5.94 (3.67)	8.29 (2.49)	10.53 (1.88)	12.28	.000
<b>IPC</b>	8.87 (1.24)	4.54 (1.96)	6.77 (1.58)	10.14 (1.34)	51.23	.000
<b>RWR</b>	5.10 (1.27)	2.01 (1.11)	2.83 (1.15)	6.50 (1.22)	63.38	.000
<b>CV</b>	5.98 (0.99)	3.06 (1.88)	4.36 (1.29)	8.89 (1.14)	65.81	.000
	<b>Stage 3</b>	<b>Stage 1</b>	<b>Stage 2</b>	<b>Stage 4</b>		

Values in the table are mean scores of variables within clusters (standard deviation).  
The analysis was based on 113 companies due to incomplete responses from eight of the firms.