

"Fifty Two Tools of Management Accounting"

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August 08, 2010.

Abstracts:

Sometimes it is very difficult to find out accumulate information about techniques and tools of management accounting. It create hazardous for the searcher to find out the techniques and tools from here and there. Again sometimes some want to know the basics of various techniques and tools used in management accounting. To serve these duel purposes data on various management accounting techniques are collected from various books, journals and article and accumulate in this paper. This paper discusses 52 management accounting techniques and tools, which is a subsequent version of my previous paper on management accounting tools, in brief.

Methodology:

For fulfilling the purpose of preparing the report data are collected from various books, journals and articles of managerial accounting. Each of the technique is provided with basic meaning and its' activities in brief.

Introduction:

Management accounting or managerial accounting is concerned with the provisions and use of accounting information to managers within organizations, to provide them with the basis to make informed business decisions that will allow them to be better equipped in their management and control functions.

According to the Chartered Institute of Management Accountants (CIMA), Management Accounting is "the process of identification, measurement, accumulation, analysis, preparation, interpretation and communication of information used by management to plan, evaluate and control within an entity and to assure appropriate use of and accountability for its resources. Management accounting also comprises the preparation of financial reports for non-management groups such as shareholders, creditors, regulatory agencies and tax authorities".

For fulfilling the purpose of management accounting there are already many techniques and tools prevail in the market.

Tools of Management Accounting:

Techniques of management accounting that are accumulated to present in this paper are as follows –

1. Balanced Scorecard:

Balanced Scorecard is a management accounting and strategic management system based upon measuring key performance indicators across all aspects and areas of an enterprise: Financial, Customer, Internal Process, and Learning and Growth.

2. Flexible Budget:

Flexible budget is based upon different levels of activity. It is a very useful tool for comparing actual costs experienced to the cost allowable for the activity level achieved, i.e. it is dynamic in nature as compared to static. A series of budgets can be readily developed to fit any activity level. Flexible budgeting distinguishes between fixed and variable cost, thereby allowing for a budget that can be automatically adjusted to the level of activity actually attained.

3. Cost Volume Profit (CVP) Analysis:

CVP analysis examines the behavior of total revenue, total costs and profit as changes occur in the output level, selling price and variable costs per unit or fixed costs.

Cost volume profit analysis is a powerful tool that helps manager understands the relationships among cost, volume, and profit. CVP analysis focuses on how profits are affected by the following five factors – selling price, sales volume, unit variable

costs, total fixed cost and mix of product sold (Garrison, Noreen & Brewer, 2009 – 2010).

4. Lean Thinking Model or Just In Time (JIT):

Lean thinking model or JIT is a management philosophy that strives to eliminate sources of manufacturing waste and cost by producing the right part in the right place at the right time.

The lean thinking model is a five-step management approach that organizes resources such as people and machine around the flow of business process and that pulls units through these processes in response to customer orders. The result is lower inventories, fewer defects, less wasted effort and quicker customer response times (Garrison, Noreen & Brewer, 2009 – 2010).

The five steps are as follows –

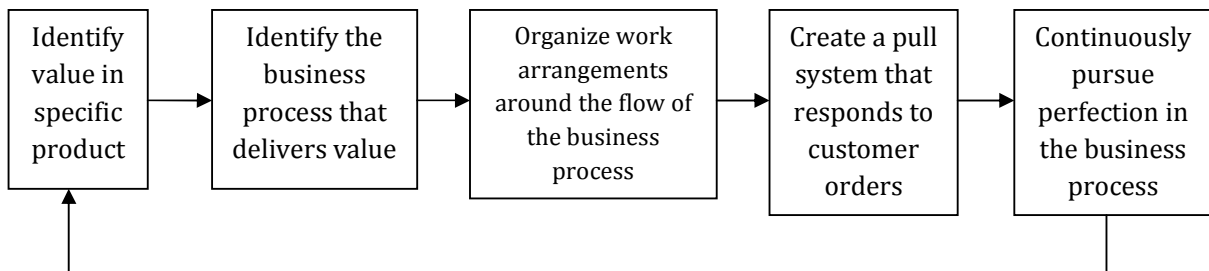


Fig: Lean Model

5. Theory of Constraints (TOC):

In 1985, Goldratt published *The Goal*, a novel about manufacturing. Goldratt devised a set of nine rules that summarize his principles of optimized production. In order to have the philosophy of *The Goal* cover more than just manufacturing operations, Goldratt's emphasis on bottlenecks led him to codify his approach to problem solving into a structured process he called the Theory of Constraints. TOC is a five-step process:

1. Identify the system's constraint(s).
2. Decide how to exploit the system's constraint(s).
3. Subordinate everything else to the decisions made in step 2.
4. Elevate the system's constraint(s).
5. If a constraint is broken in step 4, go back to step 1, but don't allow inertia to become the system's primary constraint.

(Weiss, Elliott N)

6. Six Sigma:

Six Sigma can be defined as a specific methodology to develop and implement quality improvements in an organization's critical processes by rigorously measuring and identifying variations from customer specifications in those processes and adjusting them or creating entirely new processes to keep variations at an acceptable level. Specifically, Six Sigma seeks to focus an organization on –

- defining customer/user requirements,
- aligning processes to meet those requirements,
- using metrics to minimize variations in processes,
- rapidly and permanently improving processes.

Six Sigma is a level of quality producing a frequency of defects per million operations (DPMO) that is six standard deviations from a given mean (typically defined as the average of the upper and lower limits of customer specifications for a given product or operation) based on a normalized distribution (Landel, Robert)

7. Total Quality Management (TQM):

Total Quality Management (or TQM) is a management concept coined by W. Edwards Deming. The basis of TQM is to reduce the errors produced during the manufacturing or service process, increase customer satisfaction, streamline supply chain management, aim for modernization of equipment and ensure workers have the highest level of training. One of the principal aims of TQM is to limit errors to 1 per 1 million units produced. Total Quality Management is often

associated with the development, deployment, and maintenance of organizational systems that are required for various business processes.

The primary purpose of TQM is to encourage large numbers of employees to use simplified statistical methods. Indeed, a prerequisite for initiating TQM is training the workforce in the use of statistical tools and problem-solving methods. As we have said, however, effective TQM moves beyond this to teach employees how to apply science to improve everyday decision-making. Employees faced with a problem are taught to formulate hypotheses, collect and analyze data, test hypotheses, and then to formulate new hypotheses based on their findings (Wruck, Karen Hopper and Jensen, Michael C.).

8. Enterprise Resource Planning (ERP):

According to Van and Kumar 'Enterprise resource planning (ERP) systems promise to integrate business processes within and across functional areas in organizations. Early ERP systems primarily included inventory control software, material requirements applications and manufacturing planning modules. The continual evolution of ERP systems has subsequently encapsulated the full spectrum of business processes such as selling, marketing, purchasing, warehousing, accounting, and human resource planning into tightly integrated enterprise-wide information databases. The latest generation of ERP systems extends beyond the organization by capturing inter-organizational processes such as customer and vendor relationship management' (Hunton, James E., McEwen, Ruth Ann and Wier, Benson).

9. Activity Based Costing:

Activity Based Costing (ABC) is a costing system that identifies the various activities performed in a firm and uses multiple cost drivers (non-volume as well as the volume based cost drivers) to assign overhead costs (or indirect costs) to products. ABC recognizes the causal relationship of cost drivers with activities.

ABC is a costing method that is designed to provide managers with cost information for strategic and other decision that potentially affect capacity and therefore fixed as well as variable cost. Activity based costing is ordinarily used as a supplement to, rather than as a replaced for, a company's usual costing systems. Most organization that use activity based costing have two costing systems – the official coasting systems that is used for external financial reports and the activity based costing systems that is used for internal decision making and for managing activities (Garrison, Noreen & Brewer, 2009 – 2010).

10. Job Order Costing (JOC):

Job Order Costing, generally, it is the allocation of all time, material and expenses to an individual project or job. Specifically, JOC is normally software based and provides for budgeting, forecasting, collecting and reporting on the expenditure and revenue associated with specific projects or jobs.

A job-order costing systems is used in situations where many different products are produced each period. Job-order costing is also used extensively in service industries. Hospital, law firms, accounting firms, movie studios, advertising agencies and repair shops, for example, all use a variation of job-order costing to accumulate cost for accounting and billing purposes (Garrison, Noreen & Brewer, 2009 – 2010).

11. Process Costing:

Process costing is a method of cost and management accounting applied to production carried out by a series of chemical or operational stages or processes. Its characteristics are that costs are accumulated for the whole production process and that average unit costs of production are computed at each stage.

A process costing system is used in situations where the company produces may units of a single product for long periods. Examples include producing paper at Weyerhaeuser, refining aluminum ingots at Reynolds Aluminum, mixing and bottling beverage at Coca-Cola and making wieners at Oscar Meyer. All of these

industries are characterized by an essentially homogeneous product that flows through the production process on a continuous basis (Garrison, Noreen & Brewer, 2009 – 2010).

Process costing systems accumulate cost in a particular operation or department for an entire period (month, quarter, year) and then divide these total cost by the number of units produced during the period (Garrison, Noreen & Brewer, 2009 – 2010).

12. Absorption Costing:

Absorption costing is the method under which all manufacturing costs, both variable and fixed, are treated as product costs with non-manufacturing costs, e.g. selling and administrative expenses, being treated as period costs.

Absorption costing treats all manufacturing cost as product costs, regardless of whether they are variable or fixed. The cost of a unit of product under the absorption costing method consists of direct materials, direct labor, and both variable and fixed manufacturing overhead. Thus, absorption costing allocates a portion of fixed manufacturing overhead cost to each unit of product, along with the variable manufacturing costs. Because absorption costing includes all manufacturing costs in product costs, it is frequently referred to as the full cost method (Garrison, Noreen & Brewer, 2009 – 2010).

13. Variable Costing:

Under variable costing, only those manufacturing cost that varies with output are treated as product costs. This would usually include direct materials, direct materials and the variable proportion of manufacturing overhead. Fixed manufacturing overhead is not treated as a product cost under this method. Rather, fixed manufacturing overhead is treated as a period cost and like selling and administrative expenses, it is expensed in its entirety each period. Consequently, the cost of a unit of product in inventory or in cost of goods sold under the variable costing method does not contain any fixed manufacturing

overhead cost. Variable costing is sometimes referred to as direct costing or marginal costing (Garrison, Noreen & Brewer, 2009 – 2010).

14. Standard Costing:

Standard costing is an accounting system designed to properly allocate costs of direct labor, indirect labor, materials, overhead, and selling / general / administrative accounts on a unit basis for the purpose of accurately costing products and the subsequent control of those costs in managing the production, marketing, purchasing, and administrative functions of the business.

15. Value Engineering:

Value engineering (VE) is a systematic method to improve the "value" of goods or products and services by using an examination of function. Value engineering is often done by systematically following a multi-stage job plan. Larry Miles' original system was a six-step procedure which he called the "value analysis job plan." Others have varied the job plan to fit their constraints. Depending on the application, there may be four, five, six, or more stages. One modern version has the following eight steps: Preparation, Information, Analysis, Creation, Evaluation, Development, Presentation and Follow-up.

Four basic steps in the job plan are:

- Information gathering - This asks what the requirements are for the object. Function analysis, an important technique in value engineering, is usually done in this initial stage. It tries to determine what functions or performance characteristics are important. It asks questions like; What does the object do? What must it do? What should it do? What could it do? What must it not do?
- Alternative generation (creation) - In this stage value engineers ask; What are the various alternative ways of meeting requirements? What else will perform the desired function?
- Evaluation - In this stage all the alternatives are assessed by evaluating how well they meet the required functions and how great will the cost savings be.

- Presentation - In the final stage, the best alternative will be chosen and presented to the client for final decision.

(Wikipedia)

16. Resource Consumption Accounting (RCA):

Resource Consumption Accounting (RCA) is formally defined as a dynamic, fully integrated, principle-based, and comprehensive management accounting approach that provides managers with decision support information for enterprise optimization. RCA is a relatively new, flexible, comprehensive management accounting approach based largely on the German management accounting approach Grenzplankostenrechnung (GPK) and also allows for the use of activity-based drivers. There are three core elements that enable RCA to lay a very different foundation for its cost model –

- The view of resources – resources and their costs are considered foundational to proper cost modeling and decision support. An organization’s cost and revenues are all a function of the resources that produce them.
- Quantity-based modeling – the entire model is constructed using operational quantities. Operational data is the foundation of value creation and the leading indicator of economic outcomes.
- Cost behavior – value is added as a veneer to the quantity-based model and costs/dollars behavior is determined by the behavior of resource quantities as they are applied to value creating operations within an organization.

(Wikipedia)

17. Throughput Accounting:

Throughput Accounting (TA) is a dynamic, integrated, principle-based, and comprehensive management accounting approach that provides managers with decision support information for enterprise optimization. TA is a relatively new management accounting approach based largely on the identification of factors that limit an organization from reaching its goal and is proposed by Eliyahu M.

Goldratt. Throughput Accounting uses three measures of income and expense – throughput, investment, operating expenses.

Organizations that wish to increase their attainment of The Goal should therefore require managers to test proposed decisions against three questions. Will the proposed change:

1. Increase throughput? How?
2. Reduce investment (inventory) (money that cannot be used)? How?
3. Reduce operating expense? How?

The answers to these questions determine the effect of proposed changes on system wide measurements:

1. Net profit (NP) = throughput - operating expense = T-OE
2. Return on investment (ROI) = net profit / investment = NP/I
3. TA Productivity = throughput / operating expense = T/OE
4. Investment turns (IT) = throughput / investment = T/I

18. Transfer Pricing:

Transfer pricing refers to the setting, analysis, documentation, and adjustment of charges made between related parties for good, services, or use of property (including intangible property). Transfer prices among components of an enterprise may be used to reflect allocation of resources among such components, or for other purpose. Many governments have adopted transfer pricing rules that apply in determining or adjusting income taxes of domestic and multinational taxpayers. A few countries follow rules that are materially different overall, so the transfer pricing getting momentum.

19. Cost Benefit Analysis:

Cost-benefit analysis is a term that refers both to:

- helping to appraise, or assess, the case for a project or proposal, which itself is a process known as project appraisal; and
- an informal approach to making economic decisions of any kind.

Under both definitions the process involves, whether explicitly or implicitly, weighing the total expected costs against the total expected benefits of one or more actions in order to choose the best or most profitable option. The formal process is often referred to as either CBA (Cost-Benefit Analysis) or BCA (Benefit-Cost Analysis).

The practice of cost-benefit analysis differs between countries and between sectors (e.g., transport, health) within countries. Some of the main differences include the types of impacts that are included as costs and benefits within appraisals, the extent to which impacts are expressed in monetary terms, and differences in the discount rate between countries. Agencies across the world rely on a basic set of key cost-benefit indicators, including the following:

- NPV (net present value)
- PVB (present value of benefits)
- PVC (present value of costs)
- BCR (benefit cost ratio = PVB / PVC)
- Net benefit (= $PVB - PVC$)
- NPV/k (where k is the level of funds available)

20. Flow Cost Accounting:

Flow cost accounting refers to material and energy flow analysis. Gibson and Martin (2004:49) contended that material flow analysis is basically “intended to define the material and energy flows moving through a value creating system (such as business) over a certain period”.

21. Environmental Management Accounting (EMA):

Environmental management accounting (EMA), as a part of environmental accounting, has been claimed as a beneficial tool to overcome limitation of conventional management accounting to better understanding and quantifying environment-related issue for decision making process (Burritt et al., 2002; de Beer and Friend, 2006). EMA, therefore, not only assists firms to manage cost better, but also offers green public profile.

22. Capital Budgeting:

Capital budgeting (or investment appraisal) is the planning process used to determine whether a firm's long term investments such as new machinery, replacement machinery, new plants, new products, and research development projects are worth pursuing. It is budget for major capital, or investment, expenditures. Many formal methods are used in capital budgeting, including the techniques such as – Accounting rate of return, Net present value, Profitability index, Internal rate of return, Modified internal rate of return, Equivalent annuity. (Wikipedia)

23. Managerial Risk Accounting:

Managerial Risk Accounting is concerned with the generation, dissemination and use of risk related accounting information to managers within organizations to enable them to judge and shape the risk situation of the organization according to the objectives of the organization. As a part of the management accounting system and function, managerial risk accounting has the following two main purposes:

- decision-facilitating or decisions-making
- decision-influencing or stewardship

24. Target Costing:

Target costing is a pricing method used by firms. It is defined as "a cost management tool for reducing the overall cost of a product over its entire life-cycle with the help of production, engineering, research and design". A target cost is the maximum amount of cost that can be incurred on a product and with it the firm can still earn the required profit margin from that product at a particular selling price.

Target costing refers that products should be based on an accurate assessment of the wants and needs of customers in different market segments, and cost targets should be what result after a sustainable profit margin is subtracted from what customers are willing to pay at the time of product introduction and afterwards. These concepts are supported by the four basic steps of Target Costing: (1) Define the Product (2) Set the Price and Cost Targets (3) Achieve the Targets (4) Maintain Competitive Costs.

25. Risk Modeling:

Risk modeling refers to the use of formal econometric techniques to determine the aggregate risk in a financial portfolio. Risk modeling is one of many subtasks within the broader area of financial modeling.

Risk modeling uses a variety of techniques including market risk, value at risk (VaR), historical simulation (HS), or extreme value theory (EVT) in order to analyze a portfolio and make forecasts of the likely losses that would be incurred for a variety of risks. Such risks are typically grouped into credit risk, liquidity risk, interest rate risk, and operational risk categories.

Many large financial intermediary firms use risk modeling to help portfolio managers assess the amount of capital reserves to maintain and to help guide their purchases and sales of various classes of financial assets.

26. Process Management:

Process management is the ensemble of activities of planning, monitoring and measuring the performance of a process. Especially in the sense of business process, often confused with business process reengineering. Business process management and business process reengineering are interrelated, but not identical.

Process management is the application of knowledge, skills, tools, techniques and systems to define, visualize, measure, control, report and improve processes with the goal to meet customer requirements profitably. It can be differentiated from program management in that program management is concerned with managing a group of inter-dependent projects. But from another view point, process management includes program management. In project management, process management is the use of a repeatable process to improve the outcome of the project.

27. Human Resource Accounting:

HRA can be defined as the process of identifying, recording, measuring human resources and communicated related financial information associated with the human resource to the interested users. It is the part of the management accounting which enables the manager to manage the human resource of the organization. There are mainly two types of approaches are used in human resource accounting and there are many theories for measuring human resource under this two approach – economic value approach and cost approach. (Asif, 2010).

28. Grenzplankostenrechnung (GPK):

Grenzplankostenrechnung (GPK) is a German costing methodology, developed in the late 1940s and 1950s, designed to provide a consistent and accurate application of how managerial costs are calculated and assigned to a product or service. The term Grenzplankostenrechnung, often referred to as GPK, has best been translated as either Marginal Planned Cost Accounting or Flexible Analytic Cost Planning and Accounting.

The origins of GPK are credited to Hans Georg Plaut, an automotive engineer and Wolfgang Kilger, an academic, working towards the mutual goal of identifying and delivering a sustained methodology designed to correct and enhance cost accounting information. GPK is published in cost accounting textbooks, notably Flexible Plankostenrechnung und Deckungsbeitragsrechnung and taught at German-speaking universities today.

29. Quality Costing:

Quality costs help to show the importance of quality-related activities to management; they demonstrate the cost of non-quality to an organization; they track the causes and effects of the problem, enabling the working out of solutions using quality improvement teams, and then monitoring progress. As a technique in the introduction and development of TQM, quality costing is a powerful tool for enhancing a company's effectiveness. Quality Costing provides pragmatic advice on how to set about introducing and developing a quality costing system and using the data that emerges. (Barrie G. Dale and J.J. Plunkett).

30. Value Based Management (VBM):

Value Based Management (VBM) has become a key instrument for ex ante and ex post evaluation of corporate strategies and projects from the perspective of shareholder value maximization (SVM). VBM-methods are designed to support, for example, investment and divestment decisions, and ex post evaluation of major strategic decisions. Measures of performance of management are another

important component of VBM. The performance measures are used in bonus systems in order to align managerial incentives with those of shareholders. There are a number of VBM frameworks. Shareholder Value Analysis (SVA), developed in Rapaport (1986) and Economic Value Analysis (EVA) developed by Stern Stewart (1990) are the two most well known ones. However, there exist many challengers as described in Black, Wright, and Backman (2001). Cash Value Analysis (CVA) developed by Ottoson and Weissenrieder (1996), and Cash Flow Return on Investment (CFROI), (Madden, 1999) are two offering serious alternatives to the different versions of EVA. (Lars & Clas, 2003).

31. Economic Value Added (EVA):

Economic Value Added is a new measure of performance that is purported to better align managers' incentives to that of the shareholders. EVA can be measured as Net Operating Profit After Taxes (or NOPAT) less the money cost of capital. EVA is similar to Residual Income (RI), although under some definitions there may be minor technical differences between EVA and RI (for example, adjustments that might be made to NOPAT before it is suitable for the formula below). Another, much older term for economic value added is Residual Cash Flow. In all three cases, money cost of capital refers to the amount of money rather than the proportional cost (% cost of capital). The amortization of goodwill or capitalization of brand advertising and other similar adjustments are the translations that can be made to Economic Profit to make it EVA. The EVA is a registered trademark by its developer, Stern Stewart & Co.

32. Output / Unit Costing:

Unit or output costing is a form of operation costing. It is a method of costing by the unit of production. It is adopted by concerns producing a single article on a large scale by a continuous process of manufacture, and all the units produced are identical and homogenous. The units of production are capable of being expressed in convenient unit of measurement (Iyengar, 1998).

33. Full Cost Accounting:

Full cost accounting (FCA) generally refers to the process of collecting and presenting information (costs as well as advantages) for each proposed alternative when a decision is necessary. It is a conventional method of cost accounting that traces direct costs and allocates indirect costs. A synonym, true cost accounting (TCA) is also often used. Experts consider both terms problematic as definitions of "true" and "full" are inherently subjective.

34. Service / Operating Costing:

Service costing is the form of operation costing which applies where standardized services are provided either by an undertaking or by a service cost centre within an undertaking. Like unit costing and process costing, service costing is a form of operation costing. The emphasis is on the cost of rendering services rather than the cost of manufacturing an article (Iyengar, 1998).

35. Contract Costing:

According to CIMA, terminology as "a form of specific order costing: attribution of costs to individual contracts". Being a form of specific order costing, contract costing is similar to job order costing. Both these forms are concerned with costing of specific orders. However, the term contract costing is used for jobs which take a long time to complete. Further, work being of a contractual in nature, the same is carried on away from the factory premises (Iyengar, 1998).

36. Operation Costing:

According to the CIMA terminology, operation costing is "the costing method applicable where goods or services results from a sequence of continuous or repetitive operations or process. Costs are averaged among the units produced during the period (Iyengar, 1998).

37. Uniform Costing:

The use by several undertakings of the same costing methods, principles, and techniques, - the same basic costing methods and principles and techniques. Uniform costing is not a distinct method of costing. It is the adoption of identical costing principles and procedures by several units of the same industry or several undertakings by mutual agreement. It is only a technique with the help of which cost figures of individual members of an industry are rendered comparable.

38. High Low Method:

This is mainly a statistical tools also used in management accounting to find out the relation between fixed cost and variable cost. That means this method used in management accounting to determined the cost equation of the company. Under this method per unit variable cost is the difference of cost of higher activity and cost of lower activity divided by the difference of higher and lower activity.

39. Least Squares Regression Methods:

This method is also like the high low method, used to find out the relation between fixed cost and variable cost. But, unlike the high low method, uses all of the data to separate a mixed cost into its' fixed and variable components by fitting a regression line that minimizes the sum of the squared errors.

40. Operating Leverage:

The operating leverage is a measure of how revenue growth translates into growth in operating income. It is a measure of leverage, and of how risky (volatile) a company's operating income is. Normally it is calculated as contribution margin or CM (sales revenue less variable cost) divided by net operating income or NOI.

41. Break Even Analysis:

The break-even point for a product is the point where total revenue received equals the total costs associated with the sale of the product ($T_R = T_C$). A break-even point is typically calculated in order for businesses to determine if it would be profitable to sell a proposed product, as opposed to attempting to modify an existing product instead so it can be made lucrative. Break even analysis can also be used to analyze the potential profitability of an expenditure in a sales-based business.

Breakeven point (for output) = fixed cost / contribution per unit

Contribution (p.u) = selling price (p.u.) - variable cost (p.u)

Breakeven point (for sales) = fixed cost / contribution (pu) * selling price (pu)

42. Tear Down Analysis:

Tear Down Analysis, or reverse engineering, is a process of evaluating a competitor's product to identify opportunities for product improvement. In tear down analysis, the competitor's product is taken apart piece by piece to identify the product's functionality and design and to make inferences about the process that make the product. The major element of the tear down analysis is benchmarking (Kaplan & Atkinson, 2001).

43. Quality Function:

Quality Function Development (QFD) is a management tool originally developed during the 1970s in Japan's Kobe shipyards. Quality function development provides a structure to identify customer requirements, a key input into the target costing process. Organizations use QFD to identify what customer want from a product before the product design is undertaken. The process than compares what the customer wants with how the design team proposes to satisfy those requirements (Kaplan & Atkinson, 2001).

44. Reengineering:

Reengineering is the activity of redesigning a planned or existing process, and it is driven by the desire to improve a product's cost and quality attributes (Kaplan & Atkinson, 2001).

45. Kaizen Costing:

Kaizen costing focuses the organization's attention on things that managers and operators of an existing system can do to reduce costs. Therefore, unlike target costing, which planners use before the product is in production, operations personnel use kaizen costing when the products are in production. Whereas target costing is driven by customer considerations, kaizen costing is driven by periodic profitability targets set internally by senior management (Kaplan & Atkinson, 2001).

46. Functional Analysis:

Functional analysis is the process of measuring the performance of various separate functions, such as – finance, marketing, accounting, sales, production etc.

47. Taguchi Cost Function:

Taguchi Cost / Loss Function is a way to find the cost of quality. In much conventional industrial engineering, the quality costs are simply represented by the number of items outside specification multiplied by the cost of rework or scrap. However, Taguchi insisted that manufacturers broaden their horizons to consider *cost to society*. Though the short-term costs may simply be those of non-conformance, any item manufactured away from nominal would result in some loss to the customer or the wider community through early wear-out; difficulties in interfacing with other parts, themselves probably wide of nominal; or the need to build in safety margins. These losses are externalities and are usually ignored by manufacturers, which are more interested in their private costs than social

costs. Such externalities prevent markets from operating efficiently, according to analyses of public economics. Taguchi argued that such losses would inevitably find their way back to the originating corporation (in an effect similar to the tragedy of the commons), and that by working to minimize them, manufacturers would enhance brand reputation, win markets and generate profits.

The function is as follows –

$$L(y) = K(y - t)^2$$

48. Variance Analysis:

In budgeting (or management accounting in general), a **variance** is the difference between a budgeted, planned or standard amount and the actual amount incurred/sold. Variances can be computed for both costs and revenues. The concept of variance is intrinsically connected with planned and actual results and effects of the difference between those two on the performance of the entity or company.

49. Return On Investment (ROI):

Rate of profit or sometimes just return, is the ratio of money gained or lost (whether realized or unrealized) on an investment relative to the amount of money invested. The amount of money gained or lost may be referred to as interest, profit/loss, gain/loss, or net income/loss. The money invested may be referred to as the asset, capital, principal, or the cost basis of the investment. ROI is usually expressed as a percentage rather than a fraction. The rate of return can be calculated over a single period, or expressed as an average over multiple periods.

50. Economic Value Added (EVA):

Economic Value Added or EVA is an estimate of economic profit, which can be determined, among other ways, by making adjustments to GAAP accounting, including deducting the opportunity cost of equity capital. EVA is a way to determine the value created.

The basic formula is:

$$EVA = (r - c) \cdot K = NOPAT - c \cdot K$$

where

$$r = \frac{NOPAT}{K}, \text{ called the Return on Invested Capital (ROIC).}$$

r is the firm's return on capital, $NOPAT$ is the Net Operating Profit After Tax, c is the Weighted Average Cost of Capital (WACC) and K is capital employed. To put it simply, EVA is the profit earned by the firm less the cost of financing the firm's capital.

51. Life Cycle Costing:

Life cycle costing is the process of estimating and accumulating costs over a products' life cycle. Life cycle costing is particularly important in environments in which there is large planning and development costs (for example, developing a new jetliner) or large product abandonment costs (for example, decommissioning nuclear generating facilities). (Kaplan & Atkinson, 2001).

52. Environmental, Salvage and Disposal Costing:

This is the process of costing to determine the environmental, salvage and disposal costing of specific products.

Conclusion:

As management accounting has no statutory bindings like financial accounting a manager can select any techniques and tools he / she likes. Sometimes this selection depends on situation and sometimes on organization's strategy. But choosing the right strategy for the organization is a key factor.

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