The Use of Customer Value-Driven Cost Management Technique to Increase the Profit Potential Opportunities - A Proposed Comprehensive Framework

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Abstract: The purpose of this study is to propose a comprehensive cost management framework to increasethe profit potential opportunities. Advanced management accounting concepts and tools are adopted to explore and managethe main profit driver (customer value creation). A deductive approach is used to identify the variables of thecost management framework. Stage one of this study rely on reviewing prior literature in the field in order to identify the key driver that uses in managing cost. Stage two ofthe research focuses on proposing the most appropriate cost management technique that used to effectively manage the profit driver. The last stage of the research focuses on testing the perceptions of the managers of Egyptian "Information andcommunications technology" sector, the relative merits of such a framework.The most important finding in the current study, which has not been investigated in previousstudies, is that there is a strong relationship between the proposed cost management technique, which contains the four suggested steps and the profits.As the first study of its kind, this framework contributes to the theoretical literature in thefield. It is also a practical contribution in enhancing profits of the Egyptian ICT sector by effectively manage costing.

Key Words: Value Creation model, Attribute based costing, the Profit Potential Opportunities.

1. INTRODUCTION

This research focuses on the use of advanced cost management accounting technique and utilization to maximize the potential profits in commercial organizations. Enhancing companies' profit is important, but to achieve this, companies use different approaches and different management accounting tools. Advanced cost management has created an opportunity for companies to change the way they "manage "profits and to define a new framework that can improve the profits. Therefore, the main purpose of this study is to develop a comprehensive cost management framework to enhance the profits.

This paper reports on an exploratory study where the key cost driver that significantly affected profit was determined. Advanced cost management technique was then proposed and identified to develop a proposed comprehensive framework of cost management to maximize the profits. The framework takes into account key dimension that affect profit and uses the most appropriate cost management technique to manage profits.

The research measured the perceptions of managers to the proposed cost management framework and its importance in maximizing profit. Thus, the creation of the framework and the findings offer both theoretical and practical contributions to the cost management field.

This paper reflects findings from a theoretical framework development and primary data collection from managers in the Egyptian information and communications technology(ICT) sector. The framework principles provide a basis for further research in "advanced cost management" and further testing of the proposed cost management framework in different industry situations, both industry sectors and different countries. Hence, this paper creates a new knowledge related to the use cost management to enhance the profit which can be further developed both from a conceptual and practical implementation perspective.

2. DEVELOPMENT OF THE FRAMEWORK

Improve profit is a key objective of the companies. Therefore, cost management literature should develop the appropriate cost management techniques and frameworks that lead to increase profits and long term growth.

The main purpose of this study is to develop a comprehensive cost management framework to enhance the profits. Such framework is developed from the advanced literature of the cost management. To develop this framework, two stages are suggested. The first stage focuses on identifying the key cost management driver that strongly effect companies' profit. The second stage focuses on determining the most appropriate cost management technique that effectively manages such driver.

2.1. Stage One: Identify the Key Cost Management Driver

A number of studies have been analysed to identify the key cost management driver, the most important of which are discussed below.

According to McNair *et al.'s* (2001a) study, understanding customers and value performance is the first step in cost management practices that lead to profit and long-term growth. The goal is not to reduce current costs, but rather to redirect resources to the areas that can achieve profit improvement and customer satisfaction. The same authors confirm their idea in another paper (2001b), which shows that it is necessary to change from cost reduction to profit improvement. This is achieved through maximizing customer generated value, which means that the creation of value for customers improves profit (Porter, 1985 and Aaker, 1992). Plaster and Alderman (2006) agree with the previous studies and suggest that companies should concentrate their efforts on profit growth rather than cost reduction. They suggest that to achieve this, companies should use the outside-in approach, which, according to the study, takes place through adopting the customer value creation approach. This approach is defined by the study as a framework based on the customer to help the company to choose the best growth opportunities through maximizing customer generated value.

To generate this customer value, Al-Nashar (2001) states that it is necessary therefore, to manage the relationship between the value and cost of achieving such value, and to make the customer value the effective force in the companies' continuity and in achieving profit. However, Al-Nashar illustrates that under the traditional management accounting system, there is no link between the cost and the value it achieves, which is one of the most important requirements for distinguished business companies at the international level. This is further supported by the study conducted by McNair et al. (2006), which affirmed that understanding the relationship between costs and the value provided by the company to the customer is the basis for the company's ability to achieve profits. Therefore, the cost structure should be associated with the value attributes of the product or the service.

A significant study in this area focused on choosing the essential and main driver for profit improvement. Christopher (2002), shows that the essential and main driver for profit improvement should be represented in "creating customer value". This emphases that there is a direct relationship between the value creation approach, which focuses on the value provided by the company to its customers and the value appropriation represented by the value (profit) that shareholders obtain from value creation approach (Afuah, 2009). This study also shows that what should be measured for achieving this purpose is value rather than cost. At the present time, success does not result from reducing cost but rather from increasing value.

By analysing the above studies, it can be suggested that the main driver of cost management for purposes of improveprofit is represented by 'customer value creation'. However, these studies have not examined the impact of using customer value creation approach as the main driver onprofits, to select the appropriate cost management technique.

2.2. Stage Two: Development a New Cost Management Technique that Focuses on Customer Value Creation Approach

Very limited studies in cost management literature have focussed on customer value and related cost management techniques. The most important of which are discussed below.

Bromwich (1990 and 1994) advanced the attribute based costing approach. The principal purpose of this approach is to cost the attributes that create value for customer rather than the cost of function or value chain activities.

Significant studies in this area are the studies of (McNai; Polutnik and Silvi2001a; 2001b; 2006 and 2013). These developed a new cost management approach named value creation model. Such a framework focuses on defining the linkages between internal costs and market value. The framework commences by identifying bundles of attributes desired by customers and their relative importance to the customers Once attributes have been identified, costs (defined as value added, non-value added and waste) are traced to these value attributes. The identified relationship between revenue potential and value-added costs is defined by the framework as the revenue multiplier, which is argued to be a relative measure of the effectiveness of the company value strategy.

It can be concluded that very few studies proposed the use of value creation model. These studies have not illustrated how customer value can be calculated. They also have neither explained the calculation method of cost noridentified the most appropriate costing approach that can be used, which represents a

very critical issue in the application of such model. Furthermore, they have not examined the impact of such a new model on the profits.

The proposed cost management technique is adapted from the attribute-based costing approach, which is advanced by Bromwich (1990 and 1994) and the customer value creation model produced by (McNair *et al.,* 2001a, 2001b 2006 and 2013). Within this research this is termed the "customer value-driven cost management technique". Steps for the application of this technique are detailed within the following section.

2.2.1. Customer Value-Driven Cost Management Technique

The proposed cost framework includes the four suggested steps that could be used to manage cost for the purpose of enhance the profit These steps are namely, customer value analysis, measuring revenue equivalent, determining and measuring value-added cost, and identifying cost-value gap and decision-making.

Customer Value Analysis

Sustainable growth can only come from building the customer into every aspect of operations. This effort begins with a deep understanding of firm's value proposition- the list of attributes that have the potential to create customer value-and how effectively that value proposition maps to a customer's value profile for the product or service (McNair *et al.,* 2006).

Product attributes embody those characteristics, features and benefits desired by, and that create value (or utility) for, the customer and which the organization will need to provide competitively in order to generate revenue. A clear understanding of product attributes by the organization facilitates decision making about resources and capabilities required to meet customer needs and are antecedent to the determination of the costs of creating value for each customer and consideration of profit.

In order to use such attributes in determining customer value, the following steps are followed (Gabre, 2007):

- Identifying product alternatives: for each product there are different alternative attributes.

  Identifying attributes: a customer regards the product as a set of attributes that offer a benefit or a number of benefits that satisfy needs Customer value attribute data are collected by a survey of an unbiased sample of customers. This survey asking a number of customers about the main attribute they wish to have available in the product. This can be done by telephone or by mail.

- Determining the availability of the attribute in each alternative from the customer's viewpoint: In this context, different weights can be used, ranging from 1 to 5. The use of percentages to represent the availability of the attribute in each alternative could also be used.

- Determining the degree of importance given by the customer toeach attribute: here also the previous weights can be used. It is also possible to use percentages that represent, in total, the figure 1 as a whole number.

- Determining the expected value of each alternative: in this step, it is possible to estimate the degree of importance given by the customer for each attribute value obtained by the customer from each alternative. This value could be calculated in the following equation:

The value obtained by the customer from each alternative =

$$\text{SUM} + \begin{cases} \text{Degree of availability of each attribute of the individual value} \\ \\ \text{Degree of importance determined by customer for each attribute} \end{cases}$$

The above equation can be represented by table 1.

Table 1
Expected Customer Value

Product Alternatives	Products Main Attributes							Expected Customer Value
	Attribute 1		Attribute 2		Attribute 3		AttributeN	
	Availability Degree Or Percentage	Importance	Availability Degree Or Percentage	Importance	Availability Degree Or Percentage	Importance		
1								
2								
3								
4								

With the help of table 1, the alternative that achieves the highest expected customer value can be chosen.

After that, a new series of steps is undertaken in order to determine the profit of each attribute with a view to close the gap between cost and value. The alternative must realize value for the customer and value for the company at the same time in order to assure continuous company profit and customer satisfaction.

Measuring Revenue Equivalent

It is suggested that thiscould be called "value-weighed revenue". Customers set the outer limits on the company's profits by defining the potential price a company can garner from its activities based on how well thecompany meets the expectations that defineacustomer's purchase decision.Thismarket price is a constraint that cannotbe easily manipulated in a competitivemarket. Customers shop, only stoppingto buy when they perceive they are receivingsuperior value, which is defined interms of a firm's product or service attributes. These pricepoints put a constraint on the profits of the company (McNair *et al.,* 2013).Based on this price, the total revenues are distributed over the selected alternative attributes by using the expected customer value (as calculated in the previous step) for each attribute, in order to reach the revenue achieved by each attribute for the company (McNair *et al.,* 2006). The following equation can be used to determine the revenue generated from each attribute taken alone:

Value-weighed revenue for attribute = total revenue x relative weight for expectedattribute value.

Determining and Measuring Value-Added Cost

The determination and measurement of Value added cost in the comprehensive framework is adapted from the attribute based costing Walker (1992, 1998 and 1999) and "value creation model"(McNair et al., 2001a, b, 2006 and2013).

The following steps are suggested:

1. Identifying activities related to each attribute (Brimson, 1998): the steps and stages of production related to each attribute are identified. The process of identification should be performed carefully because this step has an important effect on the accuracy of cost identification. At this stage, it is possible to use the "activity analysis" technique, which is considered one of the most important techniques used in providing detailed data for a company's operating level. The activities data are collected by interviewing the appropriate department manager.This helps to better understand the activities, how they should be performed, managed and improved, and to what extent they can be changed to be appropriate to the market and competition conditions. This activity analysis results in three separate entities as follows:

Firstly, waste activities represent cost which is not customer-related, and for which the customer will not pay any money. Therefore, such activities are profit-consuming. Waste is sometimes referred to as a "profit bandit" (McNair *et al.,* 2001b, 2006). Waste represented by two elements:

*   Redoing the activity: Activities can be value-adding when done for the first time, but they are non-value-adding when they are done again.

*   Excess in doing activities, to the extent that they cost higher than what the customer would pay. This creates further waste.

    Secondly, non- value-adding activities: These are classified into three types, as shown below:

*   Current value-adding business activities: these are a group of activities that are necessary for supporting value-adding activities. The customer will not pay a higher price for performing such activities efficiently (i.e. they have no effect on profit). However, the customer may pay a lower price if such activities are not performed efficiently (this will have a negative effect on profit).

*   Future value-adding business activities: these are represented in the future products and services of the company, such as innovation and development. The customer will not pay a price for future products and services (i.e. they have no effect on profit). However, the company is obliged to do so for survival and growth.

*   Administrative value-adding business activities: these are the main activities that are necessary for the continuity of work, such as salaries and information technology. The customer will not pay a price for the performance of such activities, and therefore they have no effect on profit.

Thirdly, core of value-adding activities is represented by those activities that realize direct benefit for the customer because they are strongly linked to value attributes. That is, they are determined on the basis of the product's attributes. Only such activities can generate revenues for the company. The value added core is only a small percentage of the total price for a product or service. On average, the value added core is only 20% of price. In other words, Pareto's law seems to hold: 20% of the activities generate 80 to 90%

of the firm's revenue. This suggests the first "new law" of cost management under value perspective: price is multiplicative function of the value added core of activities. Therefore, they must be regarded as a profit driver that must be focused on. There is a direct proportion between such activities and profit; each monetary unit spent on improving such activities is a means to improving profit. In other words, the companies that cannot determine which activities are directly related to value attributes are companies that have an uncertain future.

2. Identifying the cost of each activity and measuring the costs of each attribute.

Activity cost is represented by the proportion of each activity of production factors consumed by the activity and recorded as cost in the general ledger. Therefore, at this stage, production factors that are necessary for the performance of each activity and represented in personnel, equipment, materials, etc., are identified and grouped (Brimson, 1998). They are calculated on the basis of actual performance. In this step the use of the normal ABC approach to cost of the product attributes is suggested, that is, using cost drivers and cost rates. These calculations are straightforward where there is a direct one to one relationship between each activity and a particular product attribute. Some apportionment may be necessary where two or more activities are required to deliver a particular attribute, or one activity delivers two or more product attributes. Finally, the activity costs related to each attribute are grouped together (Walker, 1992 and Brimson, 1998).

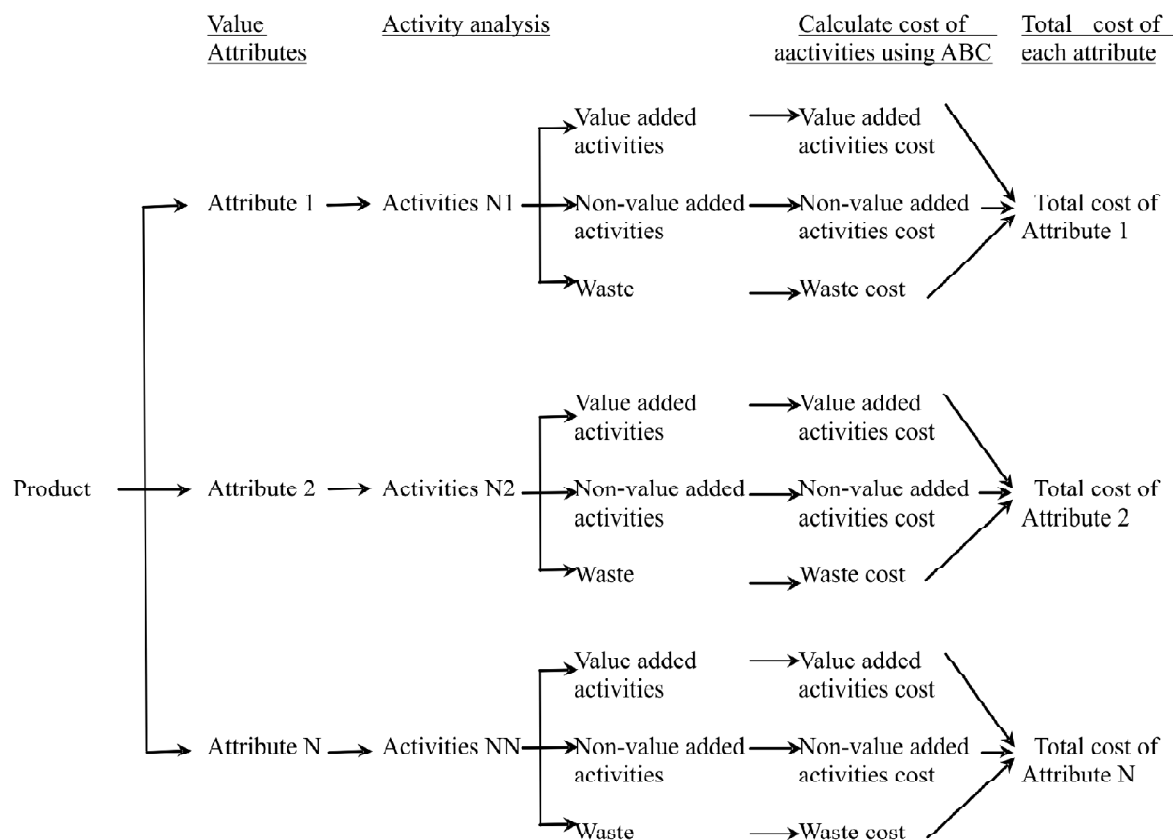Figure 1 summarizes the proposed steps adopted by the framework to measure the value added cost.

Figure1: The Proposed Steps to Calculate Customer Value Added Costing

Identifying Cost-Value Gap and Decision-Making

The basis of the company's ability to make profits is to understand the relationship between costs and the value. This is realized through understanding the relationship between what the customer will pay for the product or service, and the cost incurred by the company to supply what the customer wishes in the form of product attributes (McNair *et al.,* 2006). This relationship can be measured by using the "value multiplier" measurement (McNair *et al.,* 2006).The value multiplier is defined to measure the degree of alignment between the cost of producing a specific attribute and a revenue equivalent of that attribute (McNair *et al.,* 2001). it is one of the methods used in comparing value-adding cost with customer preferences. This is done through finding the relation between value-weighted revenue and value-adding cost by using the following equation:

$$\textit{Attribute Value Multiplier} = \textit{Value-Weighed Revenue} \div \textit{Attribute Value-Added Cost}$$

Source: McNair *et al.* (2006)

This measurement represents the amount of revenues generated from each attribute for each value-adding cost unit. That is, the attribute achieves x pounds of revenues for each 1 pound of value-adding cost. The company can be used the information provided by the value multiplier to determine where it was adding excess value and where the value proposition needed to be expanded (McNair *et al.,* 2013). The information obtained from the value multiplier measurement are also used in determining current and future leveraging factors and determining which activities the company will focus on. Furthermore, it used in coordinating between the company's activities and customer requirements for achieving competitive advantages and maximizing customer-generated value as well as maximizing profit. The current study adopted the rule of thumb suggested by McNair *et al.,* (2006). This rule of thumb for the measurement has been identified as ranging between (2-5). Using this rule of thumb, the value multiplier can be analyzed and interpreted as follows:

If multiplier < 2: this means that there is more spending on this attribute, since it generates a revenue less than $2 for each $1 of the cost incurred. In this case the company incurs losses for providing such attribute to the customer.

If multiplier is within 2-5 range: this range means that the competitive dimension is represented by the cost and that attributes and features do not represent growth leverage.

If multiplier = 5: this multiplier value refers to achieving a reasonable, appropriate level of profit.

If multiplier > 5: this value refers to achieving a big return on invested resources and represents a positive result, provided it is related to customer satisfaction.

This means that a high multiplier which is also related to customer satisfaction is a competitive advantage. The opposite is also true. A high multiplier with a low rate of customer satisfaction is considered competition weakness.

Figure 2 describes the cost management framework. The first relationship is between customer value creation as the independent variable and profit as a dependent variable. The main relationship is between customer value analysis, measuring revenue equivalent, determining and measuring value-added cost, identifying cost-value gap and decision-making as the independent variables and profit as the dependent variable.
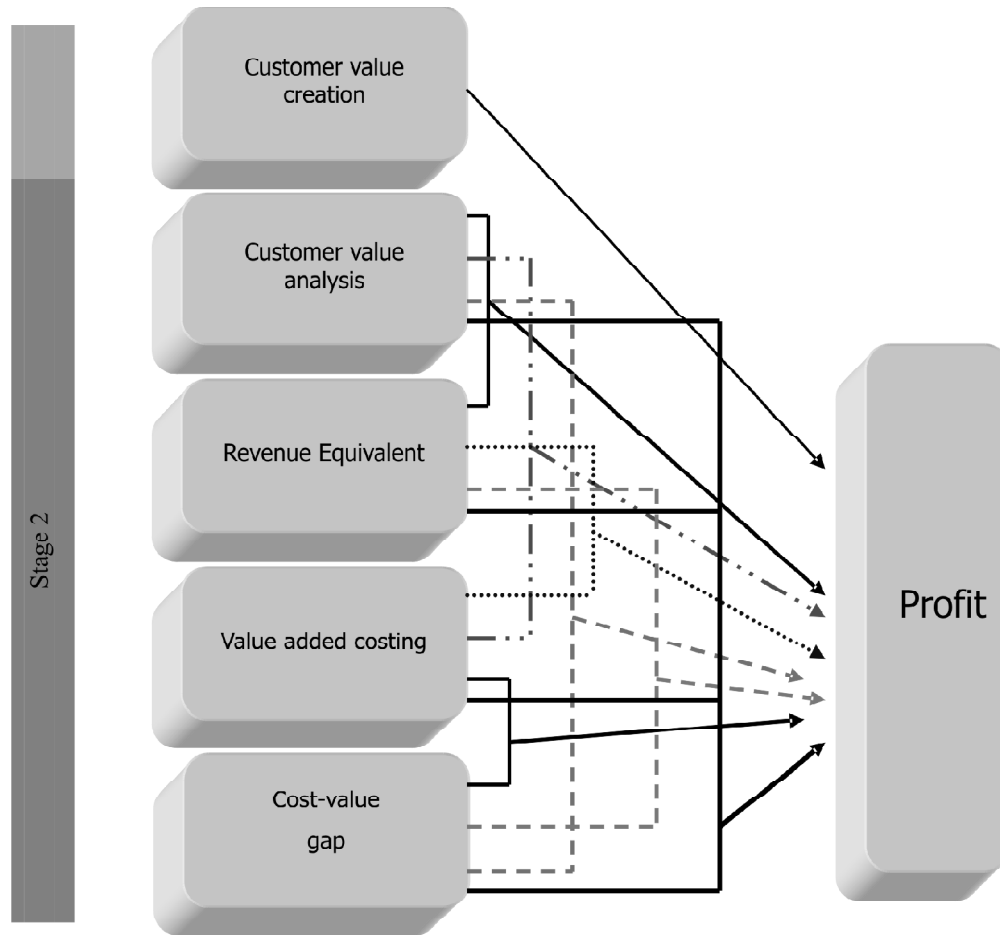
Figure 2: The Proposed Cost Management Framework

The proposed cost managementframework reflects how customer value creation as a main cost driver affects profit. In addition, such a framework reflects how the integration between the proposed variables affects profit to determine which of the various combinations of "customer value-driven cost management" variables provides the best explanation of profit. In essence, it is assumed that the integration between the four variables better predicts the level of profit than the use of any combination between any variables. Therefore, it is anticipated that the more the proposed cost framework containing the four variables is used, the more profit is achieved. Thus hypotheses related to the cost framework can be formulated as follows:

H1: Customer value creation is positively associated with profit.

H2: Customer value analysis and measuring revenue equivalent are related to profit.

H3: Customer value analysis and determining and measuring value-added cost are related to profit.

H4: Customer value analysis and cost-value gap are related to profit.

H5: Measuring revenue equivalent and determining and measuring value-added cost are related to profit.

H6 : Measuring revenue equivalent and cost-value gap are related to profit.

H7 : Determining and measuring value-added cost and cost-value gap are related to profit.

H8 : Customer value analysis, measuring revenue equivalent, determining and measuring value-added cost, and cost-value gap are more related to profit than any of the relationships identified above.

3. APPROACHTO TESTINGTHEFRAMEWORK

3.1. The Sample

Following the huge global developments in the communication and information technology (ICT) sector in the early part of the twenty-first century, Egypt as one of the developing countries has also witnessed development in this field. The EMICT (2009) cited that a leading research and information analysis company called RNCOS stated in its report that the ICT industry in Egypt has emerged as a rapidly growingsector (the development of spending on the Egyptian ICT sector; the development ofinvestments in the Egyptian ICT sector; the development of revenue in the Egyptian ICTsector; the development of the number of ICT companies; and the development in thenumber of ICT employees). This report also positions Egypt in the second place in terms ofIT industry development among all Middle East countries. This is further confirmed in thereport published by BMI (2007). This was affirmed in the Egyptian MICT report in 2007, which cited that the UK IT week magazine report stated that Egypt was trying to becomethe India of the Middle East in terms of ICT, as it sought to increase its share of the globaloutsourcing market. This position would show Egypt as a new growth market, and lead tocreating new and profitable opportunities.

Due to the importance of the ICT sector for economies which creates opportunities toincrease profit and enhance the Egyptian economy as a whole, there is a need in thissector for the suggested framework to help improving profit.

Due to time and resource restrictions, a judgment sample is used in the current study. Thecurrent study focuses only on the ICT members of the Chamber of Information Technologyand Communication (CITC). The determination of such a sample is justified as follows:

Firstly, all the members are registered in the Federation of Egyptian Industries and haveannual financial reports, in addition to which, they have financial departments and hencehave specialists in the accounting field who are more likely to be interested in the currentstudy.

Secondly, the CITC has a database, which includes detailed information aboutcompany profile, profit and loss accounts, ratios and trends and all site and tradingaddresses contact details. All of this information makes it easy to contact possiblerespondent companies, which represents a difficult task in Egypt as a developing country.

The sample is drawn from the Federation of Egyptian Industries' database. So within theEgyptian ICT sector (population), the sample included all those members of CITC. Thesample frame was 467 organizations (the total membership of CITC at the time) (FEI, 2008).The unit of analysis is the individual organizations. The respondents were financial andsenior managers within the organizations, because they are able to comment accurately onthe aspects in the questionnaire, as they have expertise in the accounting field at thestrategic level in the organization.

3.2. Questionnaire Development

The method used for data collection was a questionnaire. A self-administratedquestionnaire, delivered and collected by hand, was utilized to test the proposed framework. Asa theoretical framework of cost management was created by reviewing the literature, this framework was then used to develop thequestionnaire to test the proposed framework. The objective of this questionnaire was to collectdata about the perception of managers related to each variable in the framework and theirrelationships, which can then be used in evaluating the developed cost framework and its impact on companies' profits.

Care was taken to ensure that questions covered all theoretical constructs contained in theproposed framework. In addition, a 5-point Likert-type scale (from 1 "not important" to 5 "veryimportant" for some questions and from 1 "completely disagree" to 5 "completely agree" inothers) was used in most questions.

As the study was conducted in Egypt, the questionnaire was translated into Arabic to suitlocal users. To ensure consistency between English and Arabic versions, the questionnairewas translated back into English using a "back translation" approach before beingdistributed to ensure linguistic and (and most importantly) conceptual equivalence.

The questionnaire was pre-tested and evaluated by six reviewers, two academics familiarwith the Egyptian ICT industry, one academic statistician specializing in accountingresearch and three practitioners. Reviewers were asked to test the questionnaire andidentify unclear items and suggest changes. Changes were made, based on the commentsand suggestions received from the reviewers.

3.3. Response Rate Strategies

Questionnaires were distributed by hand to 467 individuals. After one week, companieswhich had not replied within the first week were phoned to remind them. After three weeks,a reminder letter with another copy of the questionnaire was delivered by hand tocompanies which had not replied. In all, 277 companies apologized for not completing thequestionnaire. Of the completed questionnaires, 80 were completed and collected after thefirst delivery. Fifty were collected after the first follow-up process. A further 60 werecollected after the second follow-up process. A total of 190 completed questionnaires werereceived.

3.4. Response Bias

Once all questionnaires were returned, a test was conducted to ensure that there was nosignificant difference between the responses received in the early and late stages of datacollection. To enact this, the first and last 60 questionnaires were compared. The figure of60 was used based on the slightly smaller number of questionnaires received in Phase 2and to ensure an equal sample size for comparison. The testing was done through theapplication of the two-sample Kolmogorov–Smirnov test. This is appropriate, given thenature of the data, level of measurement and sampling. It also enables all points acrossthe answer distribution to be compared. The test showed that of the 120 variables, there was no significant difference in all but sixcases. This represents a relative small percentage of the variables, and visual examinationof the distributions demonstrated that the difference was due to the presence of a fewrespondents whose answers were consistently higher in relation to these specific variables. These respondents were in the late questionnaire group. Given that they are more likely tobe general outliers in terms of these variables than evidencing a consistent response biasover all items, they were therefore included in the analysis. (see appendix 1).

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4. DATA ANALYSIS APPROACH

It is important to determine the distribution of data before applying correlation test and factor analysis because choosing the appropriate methods depends on the type of the distribution. Consequently, two normality tests were adopted in the current study: (1) skewness and kurtosis to measure how much a distribution varies from normal. They found that if a value differs from 0, this means that the distribution is not normal. (2) One-sample Kolomogorov-Smirnov test, a significant result less than .05 means that the distribution is not normal. The skewness and kurtosis for all cost items differs from zero (see appendix 2). This means that the distribution is not normal. This is further confirmed by the result of the Kolmogorov-Smirnov test which indicates that all cost items have a significance level less than .05. This confirms that the distribution of all cost items is not normal (see appendix 2).

4.1. The Reliability of Cost Driver and Related Profit Variables

The reliability Alpha of the customer value creation variable as the proposed cost driver is .89. The current study has adopted Spearman's correlation in this context because of the non-normal distribution of cost items and the ordinal nature of the cost variables (Gibbons, 1993). It has been used to further test internal consistency and to confirm the reliability of items included in this variable. The result of Spearman's correlation indicates that the three items are significant at .001 level and the correlation coefficient ranges from .719 to .730, which reflects a high correlation between items.

4.2. Factor Analysis and Reliability Test for Proposed Technique Variables

Structural factor analysis is applied to the variables of the cost model. Common Factor Analysis is used. Due to the non-normality of cost items, the current study adopted Principal Axis Factoring as the extraction method.

Before proceeding to examine the underlying relationships of cost model variables, Kaiser- Meyer-Olkin and Bartlett's tests were used to determine the appropriateness of Principal Axis Factoring. The Kaiser- Meyer-Olkin (KMO) measure of sampling adequacy indicated that the seventeen item sampling was adequate for structure factor analysis, with KMO measure = .80, which can be described as "meritorious" (Hair *et al.,* 1998). In addition, the significance level for Barlett's test is 0.00 (less than .05). Such results indicate that the data for the proposed cost management technique is appropriate for factor analysis (using Principal Axis Factoring and Varimax rotation method).

Among the 17 items included in the analysis, 15 havecommunality values ranging from 0.4 to 0.7 (from lower to moderate), which are commonmagnitudes in social science (Velicer and Fava, 1998). On the other hand, two items havecommunality values less than 0.4, which means that they do not fit well with a factor solutionand should be dropped from the analysis (Velicer and Fava, 1998). In addition, most of theitems have a factor loading greater than 0.69, indicating a strong correlation between itemsand the factor they belong to. Furthermore, all items are loaded highly on only one factorand are not split-loaded on another factor above 0.32 (Tabachnick and Fidell, 2001). Principal axis factoring with varimax provides a four-factor solution with eigenvalues of 1.0or above being extracted, and the 17 items which are retained under the four factorsexplain 61 per cent of the variance in the data set. The first factor accounts for 20 percentof the variance, the second for 18 per cent, the third for 18 per cent and the fourth for 5 percent. None of the remaining factors is significant.

For reliability analysis, Cronbach's alphais calculated to test reliability and internal consistency for each factor. The result indicatesthat the alpha coefficient for all factors is above 87 per cent, which is higher than thestandard estimates of 0.70 (Howitt and Cramer, 2008). In addition, the Spearman inter-correlation for the four factors is significant at the 0.001 level.

The factors are labeled according to the commonality of items loading on each factor and are as follows: customervalue analysis, value-added costing, cost–value gap and revenue generated fromcustomer value.

4.3. Hypothesis Tests Related to the Cost Management Framework

4.3.1. Association betweenaProposed Cost Driver and Profit

A Spearman's correlation is adopted to test the association between a cost driver and profit. The result of this test indicates that a statistically significant correlation at .001 level exists between customer value creation as a proposed cost driver and profit, with a high positive correlation coefficient of .81. Such a result suggests that focusing on customer value creation in managing cost positively affects the profit results.

4.3.2. Relationship between the Suggested Cost Management Technique and the Profit

Given the nature of the research, including the nature of the questionnaire, it lends itself tostatistical analysis of the data. Ordinal regression was utilized for the various combinations of the four variables "customer value analysis (CVA)", "revenue generated from customer value (RE)", "value added costing (VAC)" and "cost-value gap (GAP)" to find the bestcombination, which meets the proportional odds assumption, fits data well, significantlypredicts profit and produces the highest pseudo R-square statistics.

In building ordinal regression models for profitability, the five link functions provided bySPSS were tried. Although negative log-log function seems to be the best choice becauseof the lower categories of the dependent variable, not only negative log-log function isused, but also Logit link function, as it achieves better fit and meets the assumption ofparallel lines of an ordinal dependent variable (Johnson and Albert, 1999).

Table I can help assess whether the assumption that the parameters are the same for allcategories is reasonable. The assumption is not violated, as the finding is non-significantfor all models. This means that there is no significant difference between the models,indicating the relative effect of predictor variables is consistent across all levels ofprofitability. Such a result means that ordinal regression can be run for all of these models.

Table II includes the _2 log likelihood values for both the intercept-only model and finalmodel with predictors. The difference between the log likelihood values can be interpretedas chi-square distribution statistics. The significant chi-square statistic (p _ 0.05) indicatesa significant improvement over the intercept-only model, which suggests that the modelgives better prediction (McCullagh and Nelder, 1989). Such a table shows that all modelsare fit well to the data, showing the predictors' added significant value to models.

Table III shows measures that assess the overall goodness of fit of the ordinal regressionmodel. There are two goodness-of-fit statistics. They are the Pearson's chi-square statisticand deviance chi-square. These statistics test whether the observed data are inconsistentwith the fitted model. A well-fitting model is non-significant according to these tests, whichmeans that the data and model prediction are similar. The above table shows that for allcombinations of variable models, the data in that the expected and observed values did notsignificantly differ as evidenced by Pearson chi-square and by deviance chi-squarestatistics.

Table IV shows that there are three measures which are analogous to *R*-squared in ordinalleast regression. All should be taken as additional measures of model effect size. The threemeasures are Cox and Snell's *R*-square (Cox and Snell, 1989), which is a well-knowngeneralization of the usual measure designed to apply when maximum likelihoodestimation is used. However, with an ordinal dependent variable, it has a theoreticalmaximum value of less than 1.0. For this reason, Nagelkerke (1991) proposed amodification that allows the index to take values in the full zero to one range. McFadden's*R*-square (McFadden, 1973) is another version based on the log likelihood kernel for theintercept-only model and the full estimated model.

The analysis of the R-square measures for all models indicates that there are higher correlation between predictors and profitability for CVA with VAC, RE with VAC, and GAP with VAC compared with the models for CVA with RE, CVA with GAP, and RE with GAP. In addition, the model with CVA, RE, VAC, and GAP is the best model because its predictors are most strongly associated with the profitability. It can be concluded that profitability is best predicted by the model containing "customer value analysis (CVA)", "revenue generated from customer value (RE)", "value added costing (VAC)" and "cost-value gap (GAP)" together.

Table V shows that all predictors in the seven models are significant in predicting profitability. In addition, all regression coefficients in all models have positive values, which mean that for a one unit increase in each predictor variable, the profitability level is expected to change to a higher level by its respective regression coefficient, while other variables in the model are held constant.

Table I
Test of Parallel Lines

Combination of Variables	Chi-Square	d.f	Sig.
CVA with RE	2.6	2	.28
CVA with GAP	2.4	2	.30
CVA with VAC	4.8	2	.09
RE with VAC	3.4	2	.18
RE with GAP	5.1	2	.77
GAP with VAC	5.0	2	.67
CVA, RE, VAC, and GAP	6.8	4	.14

Table II
Model Fitting Information

Combination of Variables	Link Function	Chi-Square	d.f	Sig.
CVA with RE	Logit	30.0	2	.00
CVA with GAP	Logit	35.1	2	.00
CVA with VAC	Logit	86.9	2	.00
RE with VAC	Logit	73.9	2	.00
RE with GAP	Logit	23.3	2	.00
GAP with VAC	Logit	81.1	2	.00
CVA, RE, VAC, and GAP	Logit	129.6	4	.00

Table III
Goodness of Fit

Combination of Variables		Chi-Square	d.f	Sig.
CVA with RE	PearsonDeviance	106.198.2	104104	.42.64
CVA with GAP	PearsonDeviance	178.0178.4	188188	.69.68
CVA with VAC	PearsonDeviance	163.0167.5	214214	1.01.0
RE with VAC	PearsonDeviance	97.499.0	106106	.71.67
RE with GAP	PearsonDeviance	94.897.3	9696	.51.44
GAP with VAC	PearsonDeviance	158.1164.9	180180	.878.78
CVA, RE, VAC, and GAP	PearsonDeviance	391.5241.5	358358	.111.0

Table IV
Pseudo R-Squares

Combination of Variables	R-squares Measures	Values
CVA with RE	Cox and Snell	.23
	Nagelkerke	.27
	Mc fadden	.12
CVA with GAP	Cox and Snell	.28
	Nagelkerke	.31
	Mc fadden	.15
CVA with VAC	Cox and Snell	.56
	Nagelkerke	.63
	Mc fadden	.38
RE with VAC	Cox and Snell	.51
	Nagelkerke	.57
	Mc fadden	.32
RE with GAP	Cox and Snell	.18
	Nagelkerke	.21
	Mc fadden	.09
GAP with VAC	Cox and Snell	.53
	Nagelkerke	.60
	Mc fadden	.35
CVA, RE, VAC and GAP	Cox and Snell	.77
	Nagelkerke	.87
	Mc fadden	.86

Table V
Parameter Estimates

Variables	Estimate	Wald	d.f	Sig.
CVA	0.93	19.2	1	.00
RE	0.8	11.3	1	.001
CVA	0.98	20.8	1	.00

Variables	Estimate	Wald	d.f	Sig.
GAP	0.84	15.3	1	.00
CVA	1.1	22.2	1	.00
VAC	1.8	51.3	1	.00
RE	0.85	11.2	1	.001
VAC	1.6	50.2	1	.00
RE	0.75	10.1	1	.001
GAP	0.76	12.5	1	.00
GAP	0.96	17.1	1	.00
VAC	1.7	52.9	1	.00
CVA	1.4	30.0	1	.00
RE	1.1	16.7	1	.00
CVA	2.1	56.1	1	.00
GAP	1.2	22.6	1	.00

5. DISCUSSION

A quantitative analysis of data obtained reveals that there is a positive association between the use of customer value creation and profit. This means that the more the customer value creation approach is used, the more the profit is achieved by the company. Therefore, the hypothesis **(H1)** that customer value creation is positively associated with profitability can be accepted. Customer value creation focuses on understanding customers' needs and values. Companies that manage this driver effectively improve their profit. Companies that aim to increase their profitability should determine the growth opportunities that maximize customer value. In addition, they might redirect resources to the area that meets customer needs and maximizes customer value (McNair et al., 2001a, 2001b).

One note worthy finding of this study, which has not been discussed in previous work, is that integration between the four steps in the proposed cost framework is related to profit, and that each step in the comprehensive cost framework is significant in predicting profit. Although all combinations predict a higher level of profit, the best model is that which contains all four steps together, as its predictors are most strongly associated with the profit. This result emphasizes that integration between the four variables achieves better profitability than the alternative models that contained any combination of any two variables. Therefore, the hypothesis **(H8)** that integration between the four steps is more related to profitability than any of the relationships can be accepted. Companies that effectively manage costing should focus on analysing customer value, value added costing, revenues generated from customers, and managing the gap between the value of the customer and their cost together in a coherent framework as it will improve profit.

The current findings indicate that the model providing the second highest level of association is the customer value analysis and value added costing model. Therefore, the hypothesis **(H3)** that integration between customer value analysis and value added costing is related to profit can be accepted. This means that companies should focus mainly on customer value analysis and value added costing to effectively manage costing for the purpose of improving profit.

Customer value analysis focuses on identifying customer preferences and benefits obtained from products. In order to analyse customer value, companies should identify product alternative, and the attributes of each product, which give customer benefits and increase satisfaction. Furthermore, companies should determine the availability of attributes in each alternative from the customer's viewpoint and weight them in order to determine the degree of importance given by customers to each attribute. Finally, the alternative that achieves the highest expected customer value may be chosen. It can be seen that customer value analysis represents a critical strategic variable in the proposed cost framework as it focuses directly on customer need. Thus, companies that aim to improve profitability should carefully analyse customer value before they consider measuring or determining costs.

Value added costing is another key element in the proposed framework. In order to manage costs effectively activities should be classified according to their relationship with customer value and to determining the influence of such activities on profitability. Focusing on this element enables companies to determine activities that create value for customer and effectively manage them to improve profitability. As each monetary unit spent on improving such activities leads to improving profits. The activity based costing approach should be used to identify activities related to each attribute and assign overhead costs to product attributes in order to compute the cost of each attribute. Using such an approach will help to better understand activities, how they should be performed, managed, improved and to what extent they can be changed to fulfill customer needs and hence improve profitability.

The findings of this study also suggest that the "value added costing and the gap between the cost and value" model provides the third highest level of association with profit. Therefore, the hypothesis **(H7)** that integration between value-added costing and the cost-value gap is related to profit can be accepted. This finding emphasizes the importance of determine value added costing from the customer perspective and the gap between cost and value in managing cost. As such a combination between those variable improve companies' profitability.

The cost-value gap is another key variable that companies should focus on in order to successfully manage costing. This variable is concerned with comparing value adding costing with revenue (McNair et al., 2006). This can be achieved by computing the gap between value-weighted revenue and value adding costing. Focusing on such variable may enable companies to identify the current and the future leveraging factors and activities that companies should use to achieve competitive advantage and improved profitability.

The findings of the quantitative analysis indicate that the fourth highest level of association is provided by the "value added costing and revenue equivalent" model. Therefore, the hypothesis **(H5)** that integration between value-added costing and revenue equivalent is related to profit can be accepted. Revenue equivalent is a key variable in the proposed cost model. Thus companies that aim to improve profit should compute revenue equivalent, which focuses on the distribution of revenues over the selected alternative attributes by using the expected customer value for each attribute (McNair et al., 2006).

Although the previous sub-models predicted profits and strongly associated with profits, the other sub-models of customer value added and gap, customer value added and revenue equivalent and gap and revenue equivalent also predict profits but provide lower associations with profits compared with other model. Therefore, hypotheses **(H4, H2, and H6)** that such combinations are related to the profits can be also accepted.

6. CONCLUSION

This study makes a number of distinct contributions to management accounting literature. The major contribution of this study was proposed a newframework for managing costing for the purpose of enhance the profit. This framework highlights the important role that customer value creation plays in managing cost as the main profit generator in advanced management accounting. In addition, such a framework was the first to combine the perspective of attribute costing and value creation model into a coherent framework. Such a combination explains the relationship between the cost of activities and customer value and how such relationship can be managed in order to improve profit. Another significant contribution that has not been conducted by previous researches is to examine the relationship between all combinations of the four proposed steps in the cost technique and the profit to determine the best cost model in predicting profit.

One of the other most significant contributions of this study is the examination of the effect of the proposed framework on profit, which has not been addressed in the existing literature. Moreover, a key contribution is that the present study was conducted in the Egyptian communication and information technology (ICT) sector. Such a sector is growing rapidly and witnesses vigorous competition. This emphasizes the importance of focusing on customers to achieve competitive advantages and create opportunities to increase profit. As the first study of its kind, this work will significantly contribute in managing cost and enhancing the profit of the Egyptian ICT sector.

This study was conducted only in a single country and in a single sector that of the Egyptian ICT sector. The findings of this study are influenced by the particular nature and characteristics of Egypt and the Egyptian ICT sector. Therefore, the generalization of findings beyond the Egyptian ICT sector should be made with caution.

Another limitation is that the use of judgment sampling in the current study may increase the risk of producing bias and inefficient parameter estimates, which should be taken into consideration (Guo and Hussey, 2004). However, judgment sampling is the best choice in the current study for reasons related to the availability of data and to ensure access to qualified respondents in Egyptian ICT sector.

More empirical work is also needed to examine the relationship the proposed cost management technique and profit using actual financial data which will support the reliability of the findings from this study. This can be achieved by applying all proposed steps used in managing costs. Then, collecting actual financial data from this application to investigate the financial impact of such technique on profit.

Furthermore, other research methods such as case study could be used by further research to explore the proposed relationship between the proposed technique and profit. Although the ordinal regression analysis is the best choice within the present study to examine relationships as the dependent variable is ordinal, other empirical studies can be conducted by using binary or multinomial logistic regression if the dependent variable is binary or categorical to examine these relationships.

Moreover, developing generalization of the findings of this study is another fruitful and interesting area for future research. This can be achieved by conducting further empirical research to explore the relationship between the proposed cost management technique and profit across a broad range of Egyptian industries and a broad range of different countries to validate these initial findings and to establish the extent of generalization possible.

It can be concluded that the framework presented here, and its initial testing, present a rich range of future research opportunities, which will hopefully help to further develop cost management and cement its centrality in supporting good strategic decision-making and improving profit.

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APPENDICES

Appendix 1
Response Bias Test

Variables	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
c1.1	1577.500	3407.500	-1.296	.195
c1.2	1763.000	3593.000	-.210	.834
c1.3	1580.000	3410.000	-1.217	.224
c1.4	1678.000	3508.000	-.694	.488
c1.5	1777.500	3607.500	-.128	.898
c2.1	1623.500	3453.500	-1.052	.293
c2.2	1555.500	3385.500	-1.423	.155
c2.3	1737.000	3567.000	-.348	.728
c2.4	1723.500	3553.500	-.427	.669
c2.5	1603.000	3433.000	-1.104	.269
c3.1	1763.000	3593.000	-.213	.831
c3.2	1365.000	3195.000	-2.634	.008
c4.1	1794.500	3624.500	-.030	.976
c4.2	1681.000	3511.000	-.677	.498
c4.3	1735.500	3565.500	-.364	.716
c4.5	1670.500	3500.500	-.729	.466
c5.1	1712.500	3542.500	-.488	.626
c6.1	1748.000	3578.000	-.295	.768
c6.2	1647.500	3477.500	-.866	.386
c6.4	1441.000	3271.000	-2.083	.037

Appendix 2
The distribution tests

Cost Items	Skewness	Kurtosis	K-S	
			Statistic	Significant
1	-.42	.23	3.74	.00
2	-.33	-.19	3.26	.00
3	-.55	-.12	3.21	.00
4	-.81	1.17	3.79	.00
5	-.33	-.09	3.35	.00
6	-.66	1.08	3.77	.00
7	-.49	.51	3.69	.00
8	-.21	-.56	2.78	.00
9	-.23	-.13	2.90	.00
10	-.15	-.41	3.07	.00
11	-.50	-.78	3.90	.00
12	-.87	-.93	5.27	.00
13	-.46	-.02	3.25	.00
14	-.55	.17	3.87	.00
15	-.47	.06	4.10	.00
16	-.69	1.45	4.51	.00
17	-.48	.32	3.82	.00
18	-.45	-.03	3.32	.00
19	-.15	-.77	3.27	.00
20	-.07	-.44	3.43	.00
21	-.27	.05	3.68	.00
22	-.17	-.30	3.78	.00