PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA

MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH

SUPERIOR SCHOOL OF COMMERCE

Thesis submitted in the fulfillment of requirements for the Degree of 'Doctorate of science' in management sciences.

Titled:

The linkage between Balanced Score Card "BSC" and Activity-based Costing/Management "ABC/M" as a Strategic Cost Management "SCM" tool to improve strategic decisions making

A survey on Algerian companies

Elaborated By: Ibrahim FERZIZI

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October 20th 2019

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Abstract

This thesis covers study that analyzes the relationship between two of the managerial accounting tools: Activity-based Costing and Management ABC/M on a side, and the Balanced Scorecard BSC, on the other side, and their combined effect on Strategic Decisions Making SDM over various industry areas in Algeria. The first chapter was about Activity-based Costing and Management ABC/M system, by addressing how did this system rise after the fall of traditional costing systems. Then, we talked about Activity-based Costing ABC and Activity-based Management ABM, and discussed the benefits of using a cross model ABC/M on cost information and process management.

In the second chapter, we addressed the Balanced Scorecard BSC by discussing its concepts and importance for performance measurement and strategic management. Then, we exposed the four perspectives of the BSC which are: the financial perspective, the customer perspective, the internal processes perspective and the learning and growth perspective. After that, a discussion about how can BSC be used in the strategic context as a translator of the organization' strategy.

The third chapter addresses the concept and foundations of Strategic Cost management based on the analysis of Shank and Govindarajan. Then, the relationships between its instruments and ABC/M and BSC has been discussed to illustrate how can these two systems work in combination to serve the strategic context and strategic decisions making.

Finally, an empirical study is conducted in the fourth chapter to answer the research questions and test the hypotheses. After presenting the conceptual framework of the study, defining how to measure each variable, preparing the study questionnaire and choosing the study sample, the survey questionnaire has been arbitrated then sent to the sample members which are Algerian firms registered in the Algerian Business Directory (Annuaire des Entreprises Algériennes) from the official website of the Algerian Chamber of Commerce and Industry. The analysis of the study findings has revealed that there is a significant positive relationship between using ABC/M and BSC combined on strategic decisions making improvement. However, no significant impact was found between merging ABCM and the internal processes and the learning and growth perspectives on decisions about supplier selection and relationships.

Keywords: Activity-Based Costing/Management, Balanced Scorecard, Strategic Decisions Making.

ملخص

تضم هذه الرسالة دراسةً للعلاقة بين أداتين من أدوات محاسبة التسيير: المحاسبة والتسيير على أساس الأنشطة ABC/M من جهة، وبطاقة الأداء المتوازن BSC من جهة أخرى، وأثر الربط بينهما على اتخاذ القرار الاستراتيجي SDM على عينة المؤسسات الجزائرية من مختلف القطاعات. وقد كان الفصل الأول عن نظام المحاسبة والتسيير على أساس الأنشطة ABC/M، عبر التطرق أولا لقصور الأنظمة التقليدية لحساب التكاليف، ثم إلى طريقة المحاسبة على أساس الأنشطة ABC، والتسيير على أساس الأنشطة ABM، وبعدها إلى مزايا استعمال النموذج المزدوج ABC/M في تحسين معلومات التكاليف وتسيير المسارات.

أما في الفصل الثاني، فقد تطرقنا إلى بطاقة الأداء المتوازن BSC بعرض مفهومها وأهميتها كأداة لقياس الأداء والتسيير الاستراتيجي. ثم تعرضنا للمحاور الأربعة المكونة لهذه الأداة وهي (المحور المالي، محور الزبائن، محور المسارات الداخلية ومحور التعلم والنمو). وفي الأخير، تم الحديث عن الكيفية التي تخدم بها بطاقة الأداء المتوازن التوجه الاستراتيجي للمنظمة كمترجم لرؤيتها واستراتيجيتها.

في حين خصص الفصل الثالث لمفاهيم وأساسيات التسيير الاستراتيجي للتكاليف SCM باستعمال التحليل المقترح من الباحثين Shank و Govindarajan. ثم إلى الحديث عن علاقة أدواته بكل من نظام ABC/M ونظام BSC ليتبين كيف يمكن لهاذين النظامين أن يعملا في ترابط لخدمة السياق الاستراتيجي واتخاذ القرارات الاستراتيجية.

وأخيرا وفي الفصل الرابع، تم إجراء دراسة ميدانية للإجابة عن أسئلة البحث واختبار فرضياته. فبعد عرض الإطار التصوري لهذه الدراسة، وتحديد كيفية قياس متغيراتها، وإعداد أداتها (الاستبيان)، واختيار العينة المستهدفة، تم تحكيم أداة الاستبيان ثم توزيعها على أفراد العينة الذين هم مؤسسات مسجلة في دليل المؤسسات الجزائرية من الموقع الرسمي للغرفة التجارية والصناعية الجزائرية. وقد كشفت الدراسة أن هناك علاقة موجبة ذات دلالة إحصائية بين استعمال نظامي ABC/M وBSC من جهة وتحسين اتخاذ القرارات الاستراتيجية من جهة أخرى. بينما لم تثبت الدراسة وجود أثر ذي دلالة إحصائية بين المزج بين ABC/M مع محوري المسارات الداخلية والتعلم والنمو على القرارات المتعلقة باختيار الموردين والعلاقات معهم.

الكلمات المفاتيح: المحاسبة والتسيير على أساس الأنشطة، بطاقة الأداء المتوازن، اتخاذ القرارات الاستراتيجية.

Résumé

Cette thèse couvre une étude qui analyse la relation entre deux outils de comptabilité managériale : la comptabilité et gestion a base des activités ABC/M et le tableau de bord prospectif BSC ainsi que leur effet combiné sur la prise de décision stratégique dans divers secteurs industriels en Algérie "Wilaya d'Alger". Le premier chapitre porte sur le système de comptabilité et de gestion a base des activités ABC/M, en examinant comment ce système a émergé après la fin des systèmes traditionnels des coûts. Nous avons ensuite examiné les systèmes ABC et ABM, et discuté les avantages de l'utilisation d'un modèle croisé ABC/M sur les informations de coûts et la gestion des processus.

Dans le deuxième chapitre, nous nous sommes penchés sur le tableau de bord prospectif BSC en discutant son concept et son importance pour la mesure de la performance et le management stratégique. Un exposé des perspectives du BSC a été par la suite fait; celles-ci sont au nombre de quatre: la perspective financière, la perspective client, la perspective des processus internes et la perspective d'apprentissage et de croissance. Après cela, une discussion sur la façon dont le BSC peut être utilisé dans le contexte stratégique en tant que reflet de la stratégie de l'organisation.

Le troisième chapitre aborde le concept et les fondements de la gestion stratégique des coûts basée sur l'analyse de Shank et Govindarajan. Ensuite, les relations entre ses instruments et ABC/M et BSC ont été discutées afin d'illustrer comment ces deux systèmes peuvent fonctionner en combinaison pour servir le contexte stratégique et la prise de décisions stratégiques.

Enfin, une étude empirique est menée dans le quatrième chapitre pour répondre aux questions de recherche et tester les hypothèses. Après avoir présenté le cadre conceptuel de l'étude, défini comment mesurer chaque variable, élaboré le questionnaire et choisi l'échantillon de l'étude, le questionnaire a été arbitré puis envoyé aux membres de l'échantillon qui sont des entreprises inscrites à l'Annuaire des Entreprises Algériennes sur le site officiel de la Chambre de Commerce et d'Industrie Algérienne. L'analyse des résultats de l'étude a révélé l'existence d'une relation positive significative entre l'utilisation d'ABC/M et de BSC combinée et l'amélioration des décisions stratégiques. Cependant, aucun impact significatif n'a été trouvé entre la fusion d'ABCM et les perspectives de processus internes et de l'apprentissage & croissance sur les décisions stratégiques concernant la sélection et les relations avec les fournisseurs.

Mots Clés : La méthode ABC ABM, le tableau de bord équilibré, la prise de décision stratégique.

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Table of Contents

List of Figures

List of Tables

List of Appendices

Introduction

Introduction:

Since the 1980s, the business environment has dramatically changed, the competition has increased, many new manufacturing and information technologies introduced, and the form of the organization's management has changed. As a result of that, significant changes in cost accounting and management have occurred.

By then, traditional costing methods became insufficient to provide accurate and helpful information to managers, as those methods (full costing, standard costing, variable costing …) deal with the idea that the critical part of products costs are direct costs, while cost structure has moved to a new structure, based on the sustaining costs (or overheads). So, the need for accurate cost information has risen more and more.

To deal with the new external environment and the internal needs for cost information, both practitioners and academics have created new cost accounting and management techniques, starting with the introduction of Activity-based Costing ABC in the middle of the 1980s and Activity-based Management ABM in the early 1990s. At the same time, new tools of management and performance control have been created, such as Balanced Scorecard BSC. From that time, the attention on cost management has moved to the strategic view; to obtain and sustain competitive advantage. Based on Porter's analysis, Shank suggested a new approach to cost management; he, with other researchers, used the term of strategic cost management as a model of managing costs strategically, using the concept of the Value Chain and Cost Driver analysis.

Many academics and practitioners consider Activity-based costing ABC as one of the most important innovations in management (Gosselin, 2007) and a vital instrument of strategic cost management. It emerged as a costing method in the United States in the 1980s. According to Hilton (2005), ‘‘ABC is a two-stage procedure used to assign overhead costs to products and services produced. In the first stage, significant activities are identified, and overhead costs are assigned to activity cost pools following the way the activities consume the resources. In the second stage, the overhead costs are allocated from each activity cost pool to each product line in proportion to the amount of the cost driver consumed by the product line.’’ (Hilton, 2005, p: 641).

At first, the use of activity-based costing was limited in the costing area. By the time, however, both academics and consultants who observed or contributed to ABC

implementations found other benefits, such as the possibility of getting better cost management opportunities; ABC can provide helpful information to the management of costs and activities (Gosselin 2007). These conclusions led to the emergence of other use of “activity-based” analysis, in management, it was activity-based management ABM, Activity-based management complements ABC by using its information in the analysis of processes to identify inadequacies and non-value-added activities (Turney 1996, Cooper and Kaplan 1998 and Blocher et al. 2010). By the emergence of ABM in the 1990s, Turney developed a cross-view combining both ABC and ABM in a model he called "the two-dimensional ABC/M model", or activity-based cost management model ABC/M (Turney, 1996, p: 96).

ABC/M uses different cost drivers to trace costs to cost objects using multilevel cause and effect relationships, not just the production volume (Kaplan & Cooper, 1998). This diversity in the use of cost drivers provides more accurate and valuable information for decision making (Kaplan & Cooper, 1998). Specific activity and cost information could also have strategic value if used to assess the contribution of a particular activity to strategy. Although all its advantages, the ABC/M system has some limitations; ABC/M may be complicated and expensive because of the massive amount of cost centers (activities) and cost drivers. For this issue, ABC/M have to be combined with other strategic tools such as the Balanced Scorecard.

The Balanced Scorecard is a performance measurement and strategic management system; it appeared in the early 1990s by Kaplan and Norton; it uses four perspectives to measure the organization's performance: the financial perspective, the internal process perspective, the customer perspective and the learning and growth perspective. Many studies demonstrated that BSC is a powerful tool for translating and communicating the organization's vision and strategy.

According to Newing (1995), the use of the Balanced Scorecard in combination with ABC and ABM provides excellent results for the organization. He states that ABC and ABM are integral parts of the BSC; they show measured visibility of what affects cost from inside and outside the organization. ABC system provides an accurate calculation of resources consumption. Thus, ABC can allow the measurements within all the BSC perspectives and supports in analyzing the links between the four perspectives (Newing, 1995).

The combined model of ABC/M and BSC could adjust the strategic measurements of the BSC and utilize them as a tool for gathering, sorting out, and analyzing activity and cost information. This would conquer the previously mentioned limitations of ABC by arranging complex activity and cost information and by giving a robust strategic link between activity costs and strategic objectives.

Making strategic decisions is a necessary action in any organization because they consume considerable time and resources in their analysis. According to Cooper and Kaplan (1998), Strategic decisions are those decisions that are made about: Product mix and pricing, Customer relationships, Supplier selection and relationships and Product design and development. Like any decision, strategic decisions must be made on the basis of correct, accurate and comprehensive information. The strategic decision-maker should have a holistic view of all the aspects of the organization which affect or will be affected by his decision.

In this study, we will examine the impact on strategic decisions making if the organization use a combined model between activity-based costing/management ABC/M and the balanced scorecard BSC.

The study questions

This study attempts to answer the following main question:

Is there an impact from using Activity-Based Costing/Management ABC/M combined with the Balanced Scorecard BSC on strategic decisions making SDM improvement?

In our study, we will use the types of strategic decisions mentioned above (based on Kaplan and Cooper 1998) as dependent variables. The four perspectives of the balanced scorecard (Financial, Internal processes, Customers and learning and growth) and activity-based costing/ management success will be used as independent variables.

From the main question above, we can ask more sub-questions as follow:

- Is there an impact between activity-based costing and management combined with the financial and customer relationship perspectives on decisions about product mix and pricing and customer relationships?

- Is there an impact between activity-based costing and management combined with the internal processes and the learning-growth perspectives on decisions about Supplier selection and relationships and Product design and development?

The study objectives

The study seeks to answer these two questions, and therefore its objectives are:

- To show the importance and utility of using new techniques of managerial accounting such as activity-based costing and management and the balanced scorecard for the Algerian companies.
- To display how ABC/M and BSC can be used to serve strategic cost management.
- To study the impact of using ABC/M and the BSC on Strategic Decisions making in the Algerian context.

The study hypotheses

The hypotheses of this study are stated as follow:

- There is a positive impact of using activity-based costing and management combined with the balanced scorecard on strategic decisions making improvement.

This hypothesis can be divided into other sub-hypotheses as follow

- There is a positive impact of using activity-based combined with the financial and customer relationship perspectives on decisions about product mix and pricing and customer relationships.
- There is a positive impact of using activity-based information combined with the internal processes and learning-growth perspectives on decisions about Supplier selection and relationships and Product design and development.

The utility of the study

The utility of this study lies in the importance of the strategic context for any organization and the vital role of cost and performance measurement. It is crucial to any organization to have accurate, timely and valuable information about how resources are being consumed; in this matter, activity-based costing and management system provides an excellent framework to calculate costs for different cost objects and facilitate cost management through activity value analysis. Moreover, the linkage of performance

measurement to the strategy is becoming more critical in the current business environment, especially for the Algerian firms, where new attention has been given to modern management tools; and here comes the active role of the Balanced Scorecard as it allows evaluation of performance and the translation of the strategy into measures from different perspectives of the firm.

The decision-making process in general and the strategic decision, in particular, are of the utmost importance since these decisions affect the long-term orientation of the organization. The error in this process may lead to undesirable consequences. Therefore, the decision-maker must build it on a solid information base that should be comprehensive of all aspects of the organization work.

The importance of this study stems from its role in establishing a framework for the relationship between the use of ABC/M and BSC on the one hand and strategic decisions on the other. This study is complementary to research in the field of cost measurement and performance evaluation systems.

The motivation for the study

The main reason for choosing this topic is to provide pertinent and valuable information to Algerian managers about new techniques of managerial accounting, such as the activity-based costing and management system and the balanced scorecard. Moreover, this study is meant to offer a path for further research on the use of these tools and other new techniques in Algeria.

The prior studies

Several studies on recent trends in activity-based costing and management and the balanced scorecard have shown the critical value of their outputs in terms of accuracy, timeliness and integration with management systems. Here, we will display some important studies which used either ABC/M or BSC effects on decision making; then, we will address studies that tried to combine with those two tools and use the interaction to serve different purposes.

1- The impact of ABC/M on decision making

Several studies have touched on the subject of ABC and ABM and their effect on improving management information and decisions. However, we find that direct studies on the relationship between ABCM relationship and decision making are relatively few, and in this regard, we present three studies:

- The study of Stevenson et al. (1993) "Activity-based Costing: An Emerging Tool for Industrial Marketing Decision Makers": this study examined the problem of data accuracy of traditional costing models when making marketing decisions about pricing, transportation, advertising, salesforce allocations and product line additions and deletions. After presenting a number of case studies, the researchers concluded that the use of ABC would give accurate and reliable information, which would contribute to improved marketing decision making.
- The study of Gupta & Galloway (2003) "Activity-based costing/management and its implications for operations management": In this paper, the writers show how an ABC/M system can serve as a valuable information system to support effective operations decision-making processes. They propose a conceptual framework to discuss the managerial implications of an ABC/M system for various operations management decisions related to product planning and design, quality management and control, inventory management, capacity management and workforce management. The writers demonstrate that the use of the ABC/M system can lead to improved operations decision-making quality.
- The study of Khataie et al. (2011) "Activity-Based Costing and Management applied in a hybrid Decision Support System for order management": in this article, the writers tried to incorporate activity-based costing and management (ABC/M) as a link to merge the system dynamics simulation with mixed-integer programming as a hybrid decision support system. By adopting a conceptual framework in a case study, the researchers concluded that the presented hybrid modelling method could achieve an on-time cost analysis, which may lead to better decisions based on updated information.

All the above studies have demonstrated that the use of an activity-based costing and management ABC/M system improves decision making. But although many researchers in many articles mention that ABC/M improves strategic decision making,

we hardly find a study that measures the impact of using ABCM on strategic decisions using a case study or survey methodology.

2- The impact of the Balanced scorecard on decision making

Since its appraisal in 1992, the balanced scorecard has proven its usefulness in three main roles, a performance measurement system, a strategic management system and an excellent communication tool to translate the vision and strategy to a set of balanced financial and none financial measures from four perspectives (Kaplan & Norton, 1992, 1996a, 2000, 2001c, 2001b; Niven, 2002, 2005, 2006, 2008, 2014). Other studies tried to discuss other aspects of the balanced scorecard (strengths and advantages, implementation case studies in different areas, limitations and boundaries…).

For the purpose of this study, we can present the study that mentioned the use of the balanced scorecard to support managerial decisions. In his article "A "system dynamics-based Balanced Scorecard" to support strategic decision making Insights from a case study", Barnabè (2011) tried to use the balanced scorecard architecture with system dynamics principles to offer better support for strategic management decisions. For this matter, the researcher chooses a case study methodology in a service organization by developing strategy maps and the balanced scorecard according to system dynamics modelling principles. This study found that a "system dynamics-based Balanced Scorecard" can allow a better understanding of complexity and dynamics, which facilitate the process of organizational learning, and support policy design and strategic analysis.

This study addresses strategic decision-making in general without mentioning which types of strategic decisions are affected by the use of the balanced scorecard.

3- Strategic decision making

The topic of strategic decision making has known different studies from several perspectives. Some studies focused on the process of strategic decision making by discussing if this process impacts the effectiveness of the decisions (Dean & Sharfman, 1996; Harrison, 1996; Harrison & Pelletier, 2001; Rusjan, 2005), other studies examined the success in strategic decisions implementation (Al-Ghamdi, 1998; Alexander, 1985), while some researchers chose to discuss the information useful when making strategic decisions (Citroen, 2011; Frishammar, 2003). For the purpose of this study, what matters

most is the relationship between strategic decisions and the quality and source of data needed by the decision-maker; in this matter, Walters et al. (2003) in their study "Strategic information and strategic decision making: the EIS/CEO interface in smaller manufacturing companies" discuss the need of information for the decision-maker, the researchers propose that internal information is as important as external information about the environment; to confirm this hypothesis, they conducted a survey of CEOs for small manufacturing firms. As a result, the researchers concluded that internal information (Market research, Product R&D, Basic engineering, Financial management, Cost controls and Operational efficiency) are very important as a base for strategic decision-makers.

These studies talked about the need for internal information without mentioning the tools and systems that enable access to that information. Moreover, the researchers did not address the types of strategic decisions.

4- The interaction between ABC/M and BSC

Many studies tried to address the interaction between ABC/M and BSC in different ways and in different contexts.

- The study of Liberatore & Miller (1998) "A framework for integrating Activity-Based Costing and the Balanced Scorecard into the Logistics Strategy Development and Monitoring Process": in this study, the researchers focused on how both ABC and BSC can contribute to the development of a firm's distribution channel strategy, ABC provides more accurate information profitability of distribution channels and offer a better understanding of costs which leads to enhanced accuracy of the performance measures of the BSC.
- The study of Maiga and Jacobs (2003) "Balanced Scorecard, Activity-Based Costing and Company Performance: an empirical analysis": the researchers studied the combination of ABC and BSC and its impact on the firm's organizational performance (product quality, customer satisfaction and margin on sales) by using a survey methodology. The study results showed that performance could be significantly affected when each of the four BSC perspectives interacts with ABC. Yet, the study did not find a significant positive relationship between the interaction of ABC and the internal process perspective and the margin on sales.

- The study of Theriou & Theriou (2007) “Integrating the Balanced Scorecard and Activity-Based Costing”: This study tried to build a combined model which integrates ABC/M and BSC based on the concept of analytic hierarchy process AHP, using a case study methodology. The researchers concluded that the combined model ABCM/BSC with AHP concept provides a system that enables to assist the whole decision-making process in the organization.
- The study of Elmezughi (2007) “The Relationship between Activity-Based Costing and the Balanced Scorecard and their combined Effect on Organizational Performance under Alternative Competitive Strategy”: this study tried to revisit Maiga and Jacobs (2003) work under different competitive strategic choices. The researcher used a survey methodology on a sample of Australian firms. This study found that the combination of ABC and BSC have a significant effect on organizational performance under the cost leadership strategy, while under differentiation strategy, BSC without ABC can affect customer performance positively more than ABC/BSC model can affect.
- The study of Egbunike et al. (2015) “The Use of Activity-based Costing and Balanced Scorecard for Strategic Performance Measurement: Perception of Chartered Accountants in Anambra State, Nigeria”: the researchers used the multi-regression technique to test if ABC combined with BSC has an effect of strategic performance measurement using a data collected from a survey. These study findings revealed that there is a significant effect from using ABC combined with BSC perspectives on all the aspects of performance in the organization.

From the studies mentioned above, we note:

- The use of ABC/M can support managerial decisions by providing accurate information on costs and cost drivers, which lead to enhanced decisions.
- ABC/M effect was tested on the operational decision; however, no study relates the use of ABC/M to strategic decisions.
- BSC can offer an overall view of the organization's performance from different perspectives; this provides a better base to support managerial decisions. Yet, no study linked the use of BSC with making strategic decisions.
- Although there are some studies on the interaction between ABCM and BSC, there is no study concerned with the direct impact of this interaction on the effectiveness of strategic decisions.

The main contribution of this study is that it tries to address the impact of the combination of ABC/M and BSC on strategic decisions effectiveness in the Algerian context.

The methodology of the study

This study uses a quantitative research methodology by performing a survey. The population studied is consists of companies registered in the Algerian Business Directory (Annuaire des Entreprises Algériennes) from the official website of the Algerian Chamber of Commerce and Industry. From this population, a sample of 379 firms was chosen. To test the study hypotheses, the researcher has used the multiple regression model.

The structure of the thesis

This study will be divided into four chapters; the first chapter will be about activity-based costing ABC and activity-based management ABM, by analyzing first why the traditional cost systems have failed to provide managers with accurate and helpful information to serve their need to make correct decisions. Then we discuss the features of activity-based costing and management ABC/M.

In the second chapter, we will address the balanced scorecard BSC and its use in the performance measurement and strategic alignment by addressing the four perspectives: Financial, customer, internal processes and learning and growth. Then, we will talk about how can the BSC serve in strategic management by the use of strategy maps and the cause and effect linkage between the four perspectives.

In the third chapter, we will discuss the strategic cost management concept and tools, then the relationships between these tools and ABC/M and BSC. Then, we discuss the interaction between ABC/M and BSC and try to propose a combined model based on those interactions. This chapter also will address strategic decision making.

Finally, in the fourth chapter, an empirical study will be conducted by using a questionnaire designated to a sample of companies registered in the Algerian Business Directory from the official website of the Algerian Chamber of Commerce and Industry. In this chapter, the hypotheses of the study will be tested using a multi-regression analysis.

Chapter One: Activity-based costing and management ABC/M

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Section One: The traditional costing systems

A- Overview of traditional costing systems

Determining the final cost of a product or any other cost object requires allocating all related costs. Both direct costs and indirect costs (overheads) must be allocated to cost objects. While direct costs (e.g. labor or materials) does not show any difficulty to trace them to cost objects. The allocation problem lies in the second type of cost. Overheads cannot be assigned to a specific cost object in a simple way. Hence the search for ways and techniques on the allocation of overheads has been in the middle of interest to many academics and practitioners in the field of management accounting. During the twentieth century, several costing systems were created to face the overhead allocation problem and respond to the need for accurate and timely cost information.

For the purpose of cost allocation, two main costing methods (along with other methods)[*] Were presented in order to better calculate costs of products or other cost objects. These two methods are full absorption costing and variable costing.

Under **Full (or absorption) costing**, all costs of production are treated as product costs, regardless of whether they are variable or fixed, direct or indirect.[**] The cost of a unit of product contains direct materials, direct labor and both variable and fixed overhead. Full costing assigns a portion of fixed manufacturing overhead cost to each unit of product, besides with the variable manufacturing cost.

In this method, costs incurred in the nonmanufacturing areas of the organization are treated as period costs and are reported in a manner that properly matches them with

[*] - There is also another classification of traditional costing systems into:

- **Job-costing system:** In this system, the cost object is a unit, or multiple units of a distinct product or service called a job.
- **Process-costing system**: In this system, the cost object is masses of identical or similar units of a product or service.

See e.g. (Horngren, Datar, & RAJAN, 2012, pp: 122-123)

[**] - For cost terminology concepts, See e.g. (Horngren, Datar, & RAJAN, 2012, pp: 48-54).

revenues. In order to allocate all production costs (Barfield, Raiborn, & Kinney, 2001, p: 444).

Full costing finds its origins in the works of Alexander H. Church.[1] He suggested that all costs incurred must be allocated to products in order to better trace the overall company profits to the profitability of individual products (Johnson & Kaplan, 1987, p: 55).

On the other hand, **variable costing** is a cost accumulation method that includes only variable manufacturing costs (direct labor, direct materials, and variable indirect costs) as product or inventorial costs. Under this method, fixed overheads in the manufacturing phase are considered as a period cost. Like absorption costing, variable costing treats selling and administration costs as period costs (Barfield, Raiborn, & Kinney, 2001, p: 444).

The roots of variable costing can be found in the book of Maurice Clark (1923). He was one of the original and the leading writers who distinguished the costs in the organization into variable and constant (or fixed) in order to serve the decision making in the short term. (Clark & Casson, 1923, pp: 51-54, and Johnson & Kaplan, 1987, p: 154).

The only difference between full costing and variable costing is in the treatment of fixed costs. Under full costing, they are considered as product costs, not as indirect costing, which treats them as period costs.

Both full and variable costing systems allocate even a part or all overhead to products. While direct costs are easily traceable to products or cost objects, the allocation problem of overheads remains in both systems. Yet, the real issue is how to allocate overheads. From the practice of cost accounting, two main methods were used to assign overheads to products, the one rate method and the departmental method.

I. The plant-wide rate method:

In the past, many companies simply accumulated all overhead into a single cost pool and allocated it to products on the basis of a single plant-wide rate (Atkinson, Kaplan, & Young, 2007, p: 85). It is the simplest method to allocate overheads to products. In a first stage cost assignment, all budgeted overhead costs are assigned to a plant-wide pool. Next, a plant-wide rate is computed using a single unit level driver, which is usually direct labor

[1] - Alexander Hamilton Church (1866– 1936) was an English efficiency engineer, accountant and writer on accountancy and management, known for his seminal work of management and cost accounting.

hours. Finally, overhead costs are assigned to products by multiplying the rate by the actual total direct labor hours used by each product (second-stage assignment) (Hansen & Mowen, 2006, p: 123).

With this approach, all products absorb overheads from all departments of the organization on an equal basis. Although departments usually vary in the intensity of overheads, each product has to bear a part of the overheads of all departments, even if it uses the work done in only one department.

Drury (2012) conclude that a plant-wide rate will generally result in the reporting of inaccurate product costs and can only be justified when all products consume departmental overheads in approximately the same (Drury, 2012, p: 49). However, if a diverse product range is produced with products spending different proportions of time in each department, separate departmental overhead rates should be established.

Under the plant-wide method, the allocation bases are always volume-based. A single rate among direct labor hours, machine hours, or quantity produced will be used to link overhead costs to products.

Lemarchand (2002) noted that the calculation of full costs by applying a single overhead rate to direct costs was considered less and less satisfactory, as companies grew in size and an increasing proportion of their overhead expenses resulted from mechanization (Lemarchand, 2002, p: 26).

Despite all the criticism of the plant-wide rate method, but it is still used in a few companies. Drury (2012) mentioned that some surveys indicate a small use (from 0% to 5% in 1996, 1997, and 2007) of a single plant-wide overhead rate (Drury, 2012, p: 49).

The criticism of this method led to the emergence of a new method with details. It is known as the departmental rates or the homogeneous sections.

II. The departmental rates method:

The departmental rates or the homogeneous sections as known in the French cost accounting literature, is a cost allocation method in which overheads are traced in a first stage to functional departments of the organization, as shown in Figure 1.1 and in a second stage, costs of those departments are allocated to products using a deferent allocation basis for each department.

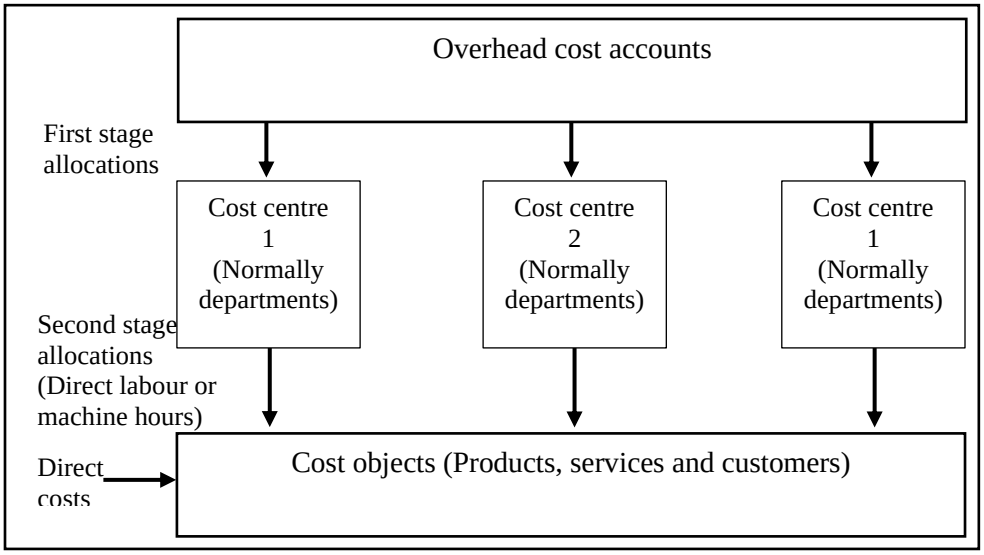

Figure 1. 1: Two-stage allocation process for traditional costing system

(Drury, 2012, p50)

This method was created in the early beginning of the 20th century, with the emergence of the scientific management school.* In the United States, Church (1908, 1910) advocated dividing the factory into a series of "production centers" through which overheads should be loaded onto products (Johnson & Kaplan, 1987, p: 55). In France, The homogeneous sections method was prescribed by the "Plan Comptable Général" (the French national accounting plan) since its origin is commonly attributed to the influence of the Rimailho Report 1928 (Bouquin, 1997). The homogeneous sections method was based on an accounting model of the production process, a model designed to provide for the most detailed analysis and apportionment of overheads (Lemarchand, 2002, p: 26). Ramalho proposed the implementation of homogeneous sections in such a way that different

* - **Scientific Management**, also called **Taylorism**, is a theory of management that analyzes and synthesizes workflows. Its main objective is improving economic efficiency, especially labor productivity. It was one of the earliest attempts to apply science to the engineering of processes and to management.
See e.g.(Helms, 2006, p: 15 and Tsutsui, 1998, p: 14)

specialized activities which constitute the section are, in principle, used in the same proportions for each task executed in that section (Carmona, 2006, p: 353).

Huge importance was given to the homogeneity condition while defining the department cost centers. Nevertheless, the allocation basis remains, to a large extent, the same used in the plant-wide method. The homogeneous sections tend to use a limited number of allocation bases or work units in the French literature (Unité d'oeuvre). Even the advocates of this method have listed a few allocation bases such as direct labor hours, machine hours, quantity of materials used, units produced, or sales amount. All the allocation bases used under this approach were volume-based (Lemarchand, 2002, p: 31, and De Rongé, 1998, p: 353).

Although the existing differences between plant-wide rate and the departmental rates methods, mainly in the number of cost centers, both methods, however, use the same volume-based allocation bases. The traditional costing system, which consists of both methods above, was designed in a time where overheads represented a small fraction of total costs. Direct labor and direct material, on the other hand, were the bulk. The idea at that time was to use the determinant factor of costs (Direct labor) as an explanation of the overall trend for the resource's consumption in the organization.

Many organizations use plant-wide or departmental rates as their cost allocation system. When the portion of overheads represents a small percentage, the system in which costs are assigned is not a major issue. In this case, using a straightforward, uncomplicated approach such as plant-wide rates is appropriate. In some settings, however, neither plant-wide nor departmental rates can work well and may actually cause severe product cost distortions. Of course, to cause a significant cost distortion, overhead costs must be a significant percentage of total manufacturing costs (Hansen & Mowen, 2006, p: 128).

In the 1980s, several changes were emerged in the business environment, causing significant shifts in the manufacturing systems by the increasing use of technology, which had led to dramatic changes in cost structure. Here we can ask: Under the new circumstances, are the traditional costing systems still relevant as an accurate source of cost information for managers for the purpose of better decision making? In the coming part of this section, we try to discuss the problems facing traditional costing systems.

B- Problems of traditional costing systems

Managers are always in need of accurate, useful and timely-provided information about the performance of their organizations. Turney argues that in the new business environment, companies need information that (Turney, 1996, p: 44):

- Shows what matters to their customers;
- Reveals how profitable their customers and products are;
- Costs a reasonable amount to report;
- Identifies opportunities for improvements; and
- Encourages actions that enhance meeting customer needs profitably.

An effective costing system should provide accurate and useful information in order to help in managing organizational performance, and support decisions making. Here we can ask, can the organization meet all these needs of managers for improving performance with the traditional system? Are traditional cost systems really obsolete?

The answer to this critical question imposes the discussion of traditional costing systems principles under the new circumstances of the business environment. Traditional cost systems were designed in a special environmental context, simple manufacturing processes, a small range of product diversifications, non-competitive markets. Traditional cost systems have been built on several hypotheses (see, e.g. Blocher, Stout, & Cokins, 2010, p: 130; Johnson & Kaplan, 1987, p: 55, 187; De Rongé, 1998, p: 353; Kaplan & Cooper, 1998, pp: 2-3, 79-81):

- Direct costs represent the bulk in cost structure, while overheads are not significant;
- Products consume resources; and
- Volume is the only cost driver.

I. The new business environment:

The business environment has known radical changes represented by the increased use of technology, and the shifts in the competition basis, causing a shorter product life cycle.

- **Changed basis of competition:** In the new environment, the basis of competition has moved from only a price factor or gaining some technological advantages, to the focus, besides the price, on the quality, product flexibility, and response time. Companies must pay more attention to how to increase customer satisfaction while being profitable at the same time. The customer should be in the middle of the organization

strategy; more efforts must be made to meet the need of customers in terms of quality, services, and flexibility.

- **Technological advances:** Advanced manufacturing technologies can permanently change the basis of competition in an industry. Advanced manufacturing technologies have impacted either product or processes (Berliner & Brimson, 1988, p: 20-21). New manufacturing systems use computer-controlled production processes, such as computer-aided design (CAD), computer-aided manufacturing (CAM), and programmable machine tools. The new environment is forcing the organization to design and implement flexible manufacturing systems that are more flexible in product diversity and more productive. These systems change the emphasis from large scale manufacturing of standard products, as the traditional costing systems assume, to a highly automated environment where the company manufactures products in small batches in a short time for specific customers, which has led to.
- **Shorter Life cycles:** Product life cycles are getting shorter, and the rate of engineering change is increasing. The accelerating rate of change of technology is dramatically shortening the life cycles of products and manufacturing facilities. With shorter product life cycles, there is an increasing need to understand the total product cost over its entire life cycle to determine profitability. Cost management systems should provide greater visibility of the impact of design considerations on manufacturing and support costs. Also, the impact of engineering changes on product/process cost should be understood in order to evaluate the need for engineering change(Berliner & Brimson, 1988, p: 21-22).

II. The impacts on cost structure:

The increased use of technology in the production process has led to a situation where direct labor is no more of a significant matter. In recent years, the importance of overhead has risen tremendously. Knowledge workers, particularly engineers and software specialists, have displayed much of the direct labor force in many plants. In some cases, overhead outside the plant, such as engineering, marketing, and distribution, has increased to where it exceeds direct labor (Turney, 1996, p: 32), as shown in Figure 1.2. Moreover, in the electronic industry, direct labor represents only 01% of the total cost, while materials represent 29%, and the rest mean overheads (De Rongé, 1998, p: 352).

In the same context, and due to the greater focus on the customers, another type of overheads has appeared and grown. Johnson and Kaplan (1987) argue that besides the importance given to manufacturing costs, attention should be paid to the costs outside the factory, particularly marketing, distribution, and services expenses, which are also representing a significant portion of total costs (Johnson & Kaplan, 1987, p: 244).

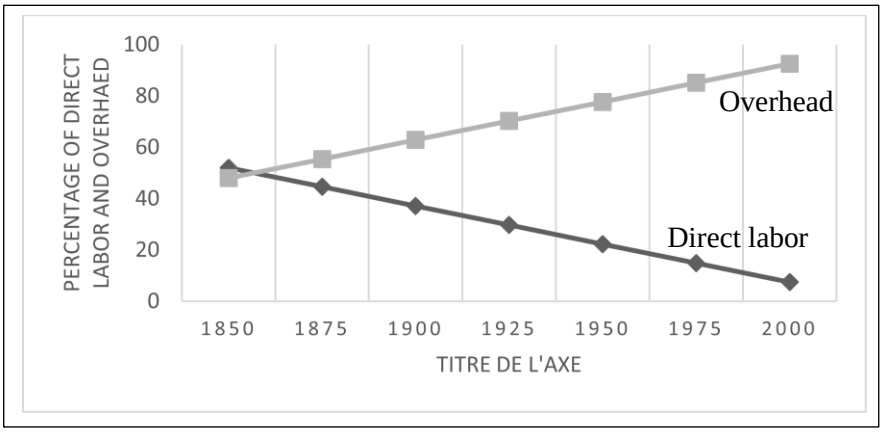

Figure 1. 2 : The relative importance of overhead costs over 150 years

(Turney, 1996, p: 34)

Additionally, the advanced automation of the manufacturing production process increases the costs of machines depreciation, product design and development, and applications engineering, which are generally fixed with respect to the level of activity. As a result of that, the short-term classification of costs into variable and fixed is less appropriate. Under these circumstances, the volume of activity cannot be considered as a cost driver in the organization, as it was assumed in the traditional costing systems.

III. Criticisms to traditional costing systems:

Traditional costing systems were dinged to work in a given environment, assuming, as mentioned above, that direct costs are the important part of costs, products consume resources, and volume is the only cost driver. We have seen how the new environment with its radical changes has affected the way organizations work and how those changes contributed to the emergence of a new cost structure based mainly on overheads and fixed costs. In this element, we try to explain how the reaction of traditional costing systems to these results fails to do what a good cost system is supposed to do.

A good costing system measures costs in the organization in order to serve the purposes of financial reporting, performance measurement, and decisions support. As argued by (Kaplan & Cooper, 1998, p: 02), the financial reporting purpose can be served by a traditional cost system. The focus of the traditional cost system was mainly driven by the external need of information. Johnson and Kaplan (1987) mentioned that the majority of academic writings on cost accounting in the mid-20th century focused on the inventory valuation as the main purpose of product costing when less importance had been given to management decisions making purpose (Johnson & Kaplan, 1987, pp: 158-159).

The use of a full costing system can give good information about inventory costs (in global) because only manufacturing costs (variable or fixed, direct or indirect) are taken into consideration when calculating costs of the product as stipulated by the international financial reporting standards IFRS.[*]

1- The lack of Cost accuracy:

Traditional costing systems use a limited number of cost pools (or even one cost pool in the plant-wide rate method) to analyze overheads. And use volume-based drivers to allocate costs to products, such as direct labor, quantity of outputs, quantity of direct materials, and amount of sales.

The aggregation of many costs in one departmental cost pool, leads to a unified treatment of these costs which are typically heterogeneous. The level of analysis of costs will be weak. Mevellec (2009) argue that the heterogeneous character of cost centers inevitably leads to focusing the analysis on cost allocation or absorption rather than the search for the real causes of costs (Mevellec, 2009, p: 52).

Using volume-based allocation bases is also a weak point in traditional costing systems. In this matter, Johnson and Kaplan (1987) state that the direct labor allocation base distorts product costs and introduces unintended cross-subsidies by shifting costs from less labor-intense products to more labor-intense products (Johnson & Kaplan, 1987, p: 189-190). Also, Kaplan and Cooper (1998) argue that the use of volume-based drivers averages resource costs between high-and low-volume products, and between

[*] - In **IAS 02 Inventories:** "The costs of conversion of inventories include costs directly related to the units of production, such as direct labor. They also include a systematic allocation of fixed and variable production overheads that are incurred in converting materials into finished goods".
See: International Accounting Standard 2: Inventories
http://eifrs.ifrs.org/eifrs/bnstandards/en/2015/ias02.pdf

simple and complex products as shown in Figure 1.3 (Kaplan & Cooper, 1998, p: 80). Low volume with higher complexity products will be under-costed, while the complexity costs are not driven by volume, and the high-volume simple products will bear costs they do not cause.

The cost distortion becomes more serious when a substantial portion of factory overhead costs is not output-volume related and the firm manufactures a diverse mix of products with differences in volumes, sizes, or complexities (Blocher et al., 2010, p: 130).

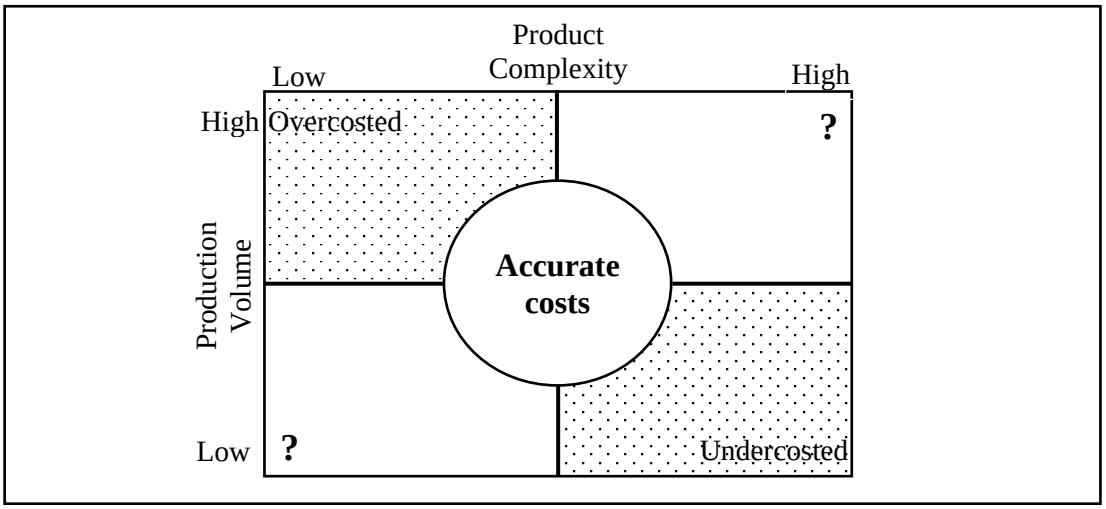

Figure 1. 3: Traditional costing systems costs distortion

(Kaplan & Cooper, 1998, p: 80).

2- The failure to provide useful Cost information:

As an inevitable result of the loss of cost accuracy, the use of traditional cost information leads to wrong decisions. The profitability analysis with wrong cost numbers will show the "under-costed" product is more profitable than the "over-costed" products. In this case, managers will focus on the wrong products, drawing attention to over-costed products whose costs may, in fact, be perfectly reasonable and ignoring under-costed products that, in fact, consume large amounts of resources (Horngren, Datar, & RAJAN, 2012, p: 162).

In the new competitive environment, quality and time (besides price) are very important to the customer. Managers need to know which part of their company does/or does not contribute to what is important to customers. Traditional costing systems report only financial information about costs of products, nonfinancial information such as orders lead time, and quality measures are not shown and even costs information given by these systems are too narrow. The importance is given only to manufacturing costs,

and little attention is given to costs outside the factory, such as marketing, distribution and engineering, which are, according to Turney, in some companies, exceed the manufacturing costs. Thus, the analysis of customer profitability using only traditional costing systems information; will not clearly highlight the high profitable customers of those who are not profitable ones (Turney, 1996, pp: 27-29).

The traditional costing systems assume that recourses consumption is linked directly to cost objects (products or services). Managing costs under this assumption is difficult; because, in reality, the way a company is working is what causes costs, not what it produces, nor the volume of what it produces.

We have seen in this section what is a cost management system, and why do a company need it. A good cost management system is supposed to provide accurate and useful information not only for the purpose of financial reporting and the establishment of financial statements, but it must also provide information that can help managers with the performance measurement and support their decisions. Many costing systems were used in the past, such as full costing or variable costing systems. Even the existed differences between those systems, they both use volume-based allocation bases when linking costs of resources used to cost objects. Traditional costing systems were designed in an environment where direct costs were the important part of the cost structure, a small variety of products were produced, and markets were not competitive. By the 1980s, however, the business environment has known radical changes; the competition is very high, the use of technology has risen, and the products life cycle is getting shorter. This new reality has affected cost structure in the organizations; by the significant increase in indirect costs and fixed costs. But alongside all these changes, traditional costing systems remained the same; they continued aggregating costs in heterogeneous cost centers and using volume allocation bases to calculate product costs. This fact resulted cost information with a weak accuracy and a narrow scope in profitability analysis, which can lead to wrong decisions about product mix and pricing.

The failure of traditional costing systems to provide accurate and useful information for performance measurement and decision support, has led both academics and practitioners in the field of management accounting to search for alternative solutions, which led to the emergence of a new costing system called Activity-based system, as we will see in the next section.

Section Two: Activity-based costing

A- The concept of Activity-based costing

Activity-Based Costing (ABC) is a new approach in management accounting; it is based on the key idea that products in the organization do not consume resources directly, but the activities performed in order to produce those products consumes the organization's resources. They play an intermediary role between resources and products or cost objects more widely.

I. Origins of Activity-based costing

Activity-based costing is a costing system that can be traced back to the work of Kaplan and Cooper in the 1980s in the USA. After many studies, they presented several articles in the Harvard Business Review showing the notion and concepts of this new system. Major and Hoque state that " The Harvard case studies showed the positive effects of organizations adopting new accounting practices, particularly on the improvement of product costing accuracy" (Major & Hoque, 2005, p: 85).

Parallel to this, another organization also had initiated a project of exploring new costing methods at the end of the 1980s. It was the work of the Consortium for Advanced Manufacturing–International (CAM-I). CAM-I is an association of large companies devoted to the development of manufacturing technology.[*] The work of CAM-I resulted in a cost management model using activities as a pivot component for costing and managing costs (Daly, 2002, p: 114).

However, some searchers advocate that activity-based costing concepts are not new in the field of management accounting (Major & Hoque, 2005, p: 85). Here we can look at both theoretical and practical areas in order to take deeper insight into the origins of ABC.

For the theatrical area, Solomons (1968) have mentioned basic concepts of a costing method which are similar to the concepts of activity-based concepts; in the context of standard costing, Solomons claimed that there is a relationship between costs and activities, so, he suggested the use of these activities as a basis to calculate overhead rates to improve

[*] - CAM-I's members include Boeing, General Electric, Kodak, Motorola, several U.S. government agencies, and most of the major accounting firms. For more information about CAM-I please visit: http://www.cam-i.org/docs/CAM-I_Overview_310.pdf

variable overhead variance analysis. The idea of using activities as primary cost objects was also presented in the work of Staubus (1971), he proposed a theoretical framework for cost accounting which was based on the principle that the use of resources must be identified, measured, and then traced to the objects of costing which are activities -according to him- (Major & Hoque, 2005, p: 85). The idea is that the use of activity to explain how resources are consumed is not new. This principle was mentioned by other researchers such as Staubus (1971), Shillinglaw (1982) and Drucker (1963) (Major & Hoque, 2005, p: 86).

On the other hand, in the world of practice, some world-class companies have tried to improve their cost accounting information. For example, General Electric used a costing methodology in the 1960s was based on the concept of activity cost analysis. This costing system was -according to Johnson- the first system that explained the causes of costs by using the term of "activity" (Major & Hoque, 2005, p: 86).

Since the end of the 1980s, ABC has become the focus of attention on both academic and practical levels. Academic research papers which discussed the ABC varied in subjects.[1]Such as the conceptual framework, the comparison with traditional systems of costing, the relationship with the managerial decisions (pricing decisions, product mix, etc ...) and it took an important place in the literature of management accounting (Gosselin, 2007). On the other hand, the implementation attempts have diffused in many companies in the United States and then Europe and Canada, and in many industry sectors, such as manufacturing, financial institutions, insurance companies, hospitals, restaurants and also in the public sector.

II. Activities and Activity Drivers concept:

Before talking about what does activity-based costing means, it is necessary to explain first its two main elements, which are "activities" and "activities drivers":

1- Activities:

The concept of activity is considered as the axis of ABC. Since the emergence of this system, the attention to this term has widely increased, many definitions have been given to this term.

[1] - See, e.g.: **James R. MARTIN**, Activity-based Costing Bibliography, Management and Accounting Web, internet website: http://maaw.info/ABCArticles.htm.

According to Brimson, an activity is a combination of people, technology, raw materials, methods, and the environment that produces a given product or service. It describes what an enterprise does: the way time is spent and the outputs of the process (Brimson, 1991, p: 46). However, Lorino (1991) gave a more inclusive definition to activity, and he defined activity as all that might be described as an act in the life of the enterprise, an activity is the primary group of tasks which (Lorino, 1991, p: 40):

- Are carried out by an individual or group;
- Use specific skills;
- Are homogeneous from the perspective of its actions towards cost and performance;
- Provide outputs;
- Are addressed to an internal or external customer;
- Use several inputs (work, machines, Information...).

Activity has become the cornerstone of new cost management systems. Ultimately, an enterprise can only manage what it does-its activities. The starting point for managing activities is to understand the resources currently assigned to today's activities (activity cost), the volume of output (activity measure), and how well the activity is performed (performance measure) (Brimson, 1991, pp: 46-47).

Activity concept importance stems from its being as a consumer of resources in the organization. It is considered the main reason for the occurrence of costs. This importance can be highlighted through the following points.

Brimson argues that activities are a powerful basis for managing an organization. Making improvements require change actions to be done on what actually people in the organization do. Changes must ultimately be made to activities. Activities can make clear the area that drives cost, such as product design, assembling or inspection, and indicate where managers should focus their attention and act. This insight cannot be available under the traditional costing systems; the use of volume basis for calculating product costs may assign more costs to high volume products, and that by result, can distort cost information. In traditional cost systems, all costs in a given department are treated in the same way, with no regard to the nature and differences between the activities performed within this department. Using activity as an intermediate to assign costs to products may guarantee a better cost assignment (Brimson, 1991, pp: 67-68). Brimson also argues that the use of the activity concept has another benefit, which is the compatibleness with Total Quality

Management (TQM): TQM has two objectives, to make things right the first time and to work for continuous improvement. The vertical (functional) view of the firm does not clearly show where the improvements must be made. Otherwise, in the process (activity) view, improvement choices are easily determined. Therefore, Activities are compatible with TQM (Brimson, 1991, p: 73).

Furthermore, the notion of activity can be used for the cost reduction objectives because it will be easier to identify which activities are non-value-added, eliminate them and redeploy the resources utilized by those activities.

2- Activity Diver:

Activity Drivers are measurements of the frequency and intensity of demand placed on an activity by cost objects (Bahnub, 2010, p: 04). Activity cost driver is a unit of measurement that allows managers to follow cost behavior in that activity. Kaplan and Cooper describe it as a quantitative measure of the output of an activity (Kaplan & Cooper, 1998, p: 95). The activity driver represents the cause and effect link between activity cost and products or services or any other cost object.

According to Bouquin, an activity cost follows two main determinants (Bouquin, 2003, p: 96):

- The number of times in which the activity occurred.
- The conditions and circumstances in which how this activity is performed.

There are different types of activity cost drivers, such as duration drivers, transaction drivers, and intensity drivers. Yet, the selection of which type of activity cost driver we need to choose for a given activity or the number of activity cost drivers should be taken in consideration in an activity-based cost system, relies on the nature of the activity, and the data availability.[*]

III. The Definition and Objectives of Activity-Based Costing.

According to Hilton, ‘‘ABC is a two-stage procedure used to assign overhead costs to products and services produced. In the first stage, significant activities are identified, and overhead costs are assigned to activity cost pools in accordance with the way the resources are consumed by the activities. In the second stage, the overhead costs are allocated from

[*] - We will discuss activity cost drivers more widely in the next section of this chapter.

each activity cost pool to each product line in proportion to: the amount of the cost driver consumed by the product line.''(Hilton, 2005, p784). This definition talks about the architecture of an ABC system, explaining the steps of tracing costs from resources to final cost objects.

Turney, from another point of view stated that activity-based costing ABC is a method of measuring the cost and performance of activities and cost objects. Assigns cost to cost objects based on their use of activities. ABC recognizes the causal relationship of cost drivers to activities (Turney, 1996, p: 72). While Mevellec chooses to define ABC as a modelling approach of the organization's operations, rather than a system to calculate costs, this modelling can also be used for the construction of the final cost calculation tools, performance control and leadership, coordination as well as their use in investment options (Duff, Cliquet, & Vailhen, 1999, p: 161).

We note that the first definition focused on the main principle of the ABC, which is that the activities consume resources and products consume activities, and also explained how the system works in two stages, the first stage where resources are allocated to activities and the second stage where these costs are distributed to cost objects. The second definition in which Turney exposure to causal relationships while linking costs of activities to cost objects. The definition Mevellec has taken a different trend, as it focused on the possible uses of the ABC more than being a cost system, this system may be used as a management tool.

Regardless of the previous definitions, the main idea in activity-based costing is that the resources are not consumed directly by the final products, but the activities performed in order to produce those products are the reason of resources consumption and cost causing. The original ABC system proposed by Kaplan and Cooper is based on a two-stage procedure as shown in Figure 1.4 (Kaplan & Cooper, 1998, p: 84). Even that the general image of an ABC system-as in Figure 1.4- looks like the traditional department costing model, but the difference is in the concepts on which each system is based, ABC links resources to activities then to final cost objects using the causality relationships.

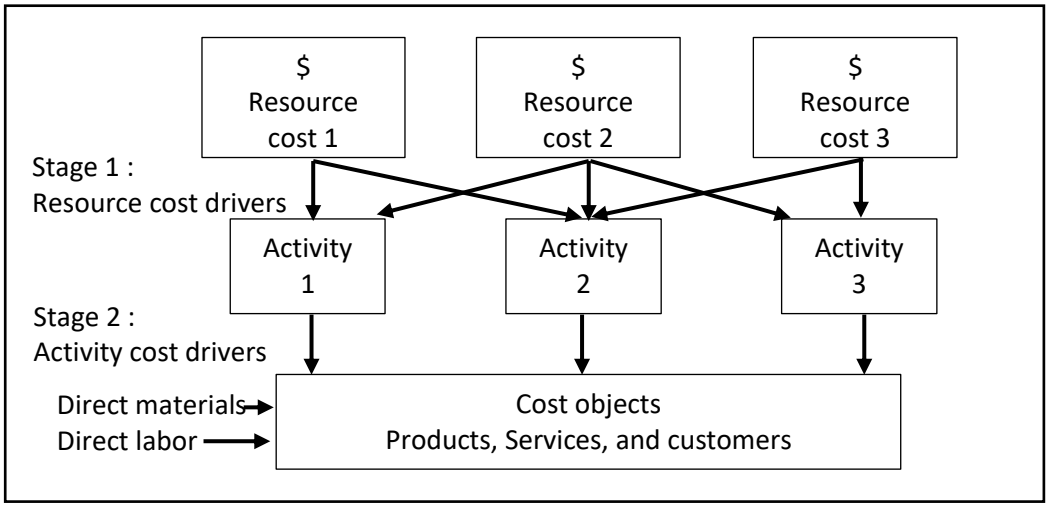

Figure 1. 4: The structure of an activity-based costing system

(Kaplan & Cooper, 1998, p: 84)

According to Kaplan and Cooper, ABC systems address an entirely different set of questions(Kaplan & Cooper, 1998, p: 79):

- "What activities are being performed by the organizational resources?
- How much does it cost to perform organizational activities and business processes?
- Why does the organization need to perform activities and business processes?
- How much of each activity is required for the organization's products, services, and customers?"

Activity-based costing system can be used as a useful map to explain the cost structure and causality in order to better cost information, especially when the company is operating in a new environment with new products and new processes. The good use of an ABC system can lead to a better understanding of products costs and profitability.

B- Construction of an Activity-Based Costing System:

An activity-based cost system consists of two stages, as shown in Figure 2.4. The first step is to allocate resources cost to activities, then in the second stage, costs of activities are traced to cost objects. An ABC system construction should be done by ABC project team. This team will require various types of expertise and usually involves not only management accountants but also representation from many departments and sections. In addition, outside consultants may be involved in the ABC system designing process. In

order to build the system, there are four major steps, as shown by (Kaplan & Cooper, 1998, pp: 85-95) and (Drury, 2012, p: 257), these steps are:

- Identifying the major activities that take place in an organization;
- Assigning costs to cost pools/cost centers for each activity;
- Determining the cost driver for each major activity;
- Assigning the cost of activities to cost objects.

I. Activities identification

This step has huge importance for two considerations. The first is that the activities are the main stones of the ABC system, and its base from which costs are calculated, and the organization's operations are modelled. So, the system must be built on a solid base through the proper identification of the activities. Secondly, the information produced by this analytic phase (Activity dictionary) will be used in the structuring of information-oriented to managers and diagnostic of enterprise business. Thus, appropriate time and effort must be given to this point, considering that is the first major step for the construction of the ABC system.

The starting point, according to Hansen and Mowen, is conducting an activity inventory by making a list of all what we can describe with an action verb in the company, such as schedule production, move materials, purchase materials, inspect items, respond to customers, improve products, introduce new products, …etc. (Hansen & Mowen, 2006, p: 134). In order to gather the list of activities, an activity analysis is performed, including gathering data from existing documents and records, as well as collecting additional data using questionnaires, observations, or interviews of key personnel. Questions that ABC project team members typically ask employees or managers in gathering activity data include (Blocher et al., 2010, p: 131):

- What work or activities do you do?
- How much time do you spend performing these activities?
- What resources are required to perform these activities?
- What value does the activity have for the product, service, customer, or organization?

According to Lorino (1991), ABC project team can use three dimensions to identify activities in the organization (Lorino, 1991, pp: 56-57):

- **The organizational structure dimension**: the simplest way to lead activity identification is based on the organizational structure. In spite of the holistic and ease of this method, however, activities identified may be influenced by the organizational borders, links between activities do not appear incorrectly.
- **The functional dimension**: the functional approach means identifying activities looking inside the enterprise functions, even within the partial functions. This method is less dependent on the effects of organizational structure, but it is more complex and rarely shows links between activities such as its predecessor.
- **The process dimension**: It is the most difficult way but the most appropriate to establish an ABC system. In this method, identification of activities is made on the basis of the activities flow chain. Here we look at the enterprise through a chain of activities and clarify on the one hand the links between these activities and between this latter and strategic outputs of the enterprise on the other hand. This dimension is considered as most independent of the organizational structure. However, it does not guarantee a holistic view, so there is a possibility that some activities may be forgotten.

Once the identification of activities is made, a list of activities called Activity dictionary is prepared. An activity dictionary contains the data gathered of all activities identified, such as activity name, tasks performed, activity customer, and the possible cost drivers which can be used to measure its performance.

In some applications, the ABC project team defined activities at a very micro level, resulting in a list of hundred or more activities. This was both expensive and confusing (Kaplan & Cooper, 1998, p: 85). Drury has mentioned that recent studies suggest that between 20 and 30 activity centres tend to be the norm. The number of activity cost centres can be reduced by aggregating activities inactivity cost pools (Drury, 2012, p: 258).

Davignon et.al stated that activities with the same goal or the same outputs can be grouped together into business processes (Ravignon, Bescos, & Joalland, 2003, p: 250). Bescos and Mendoza prefer to organize ABC system around business processes because it is consistent with the horizontal view of the firm (Bescos & Mendoza, 1994, p: 35). This approach also fits with ABM* And value chain analysis. But the problem with processes, according to Kaplan and Cooper, is that a business process might be heterogeneous to

* - ABM will be discussed in the next section of this chapter.

accumulate costs that then must be driven to cost objects by a single cost driver (Kaplan & Cooper, 1998, p: 92). A process can group activities with different cost drivers. If the system uses processes as activity cost pools, only a single cost driver would have to be selected for driving all process costs to cost objects.

Kaplan and Cooper, and Drury propose activity hierarchy as an approach to aggregate activities inactivity cost pools, considering the causality principle. Activities can be classified along a cost hierarchy dimension consisting of (Kaplan & Cooper, 1998, pp: 89-91) and (Drury, 2012, pp: 259-260):

- Unit-level activities;
- Batch-level activities;
- Product-sustaining activities;
- Facility-sustaining activities.

1- **Unit-level activities** (also known as volume-related activities) are performed each time a unit of the product or service is produced. Expenses in this category include direct labor, direct materials, energy costs and expenses that are consumed in proportion to machine processing time (such as maintenance). Unit-level activities consume resources in proportion to the number of units of production and sales volume. Typical cost drivers for unit-level activities include labor hours, machine hours and the quantity of materials processed. These cost drivers are also used by traditional costing systems. Traditional systems are therefore also appropriate for assigning the costs of unit-level activities to cost objects.

2- **Batch-related activities**, such as setting up a machine or processing a purchase order, are performed each time a batch of goods is produced. The cost of batch-related activities varies with the number of batches made but is common (or fixed) for all units within the batch. As more batches are produced, more setup resources are consumed. It costs the same to set up a machine for 10 or 5000 items. Thus, the demands for the setup resources are independent of the number of units produced after completing the setup. Traditional costing systems treat batch-related expenses as fixed costs, whereas ABC systems assume that batch-related expenses vary with the number of batches processed.

3- **Product-sustaining activities** are performed to enable the production and sale of individual products (or services). Kaplan and Cooper (1998) gave some

examples of product-sustaining activities provided: maintaining and updating product specifications and special testing and tooling for individual products and services. If customers are the cost objects, Kaplan and Cooper (1998) add an equivalent term for product-sustaining; it is customer-sustaining activities. Customer market research and support for an individual customer or groups of customers if they represent the cost object are examples of customer-sustaining activities. The costs of product- and customer-sustaining activities are incurred irrespective of the number of units of output or the number of batches. Traditional cost systems, relying only on unit-level drivers, cannot trace product- and customer-sustaining resources accurately to individual products and customers. ABC uses product-level bases such as the number of active part numbers and time spent in the activity to assign these costs to products(Drury, 2012).

4- **Facility-sustaining (or business-sustaining) activities** are performed to support the facility's general manufacturing process and include general administrative staff, plant management and property costs. They are incurred to support the organization as a whole and are common and joint to all products manufactured in the plant. Therefore, these costs should not be assigned to products since they are unavoidable and irrelevant for most decisions.

II. Assigning costs to cost pools/cost centers for each activity

After the identification of activities or activity cost centers, the cost of activities must be calculated. An activity cost is simply the cost of the resources consumed by that activity. The cost of these resources can be found in the general ledger, but how much is spent on each activity is not revealed (Hansen & Mowen, 2006, p: 138). Some resource costs can be assigned to activities using direct tracing, where many of the resources which were considered as overheads in traditional cost systems will become easily attributable to specific activity centers. For example a specific machine used in assembly activity or an engineer in product design activity. Some of the data needed for this kind of tracing can be found in the activity dictionary prepared in the first step shown above.

In the case of indirect and jointly shared resources by several activities, cause-and-effect based cost drivers can be used to trace the cost of recourses to activities (Drury, 2012, p: 258). Using a causal relationship, Brimson suggested typical resource drivers as shown in Figure 1.5 (Brimson, 1991, p: 135). Interviews, survey forms, questionnaires, and

timekeeping systems are examples of tools that can be used to collect data on resource drivers (Hansen & Mowen, 2006, p: 138).

Factor of production	Measure
People	Time
Technology	Machine/technology
Facilities	Square footage/meters
Utilities (Energy)	Kilowatt-hours

Figure 1. 5: Typical resource drivers

(Brimson, 1991, p: 135)

Once costs of resources are traced to activities or activity cost pools, the first stage of the ABC system is achieved. The next stage is to allocate the cost of activities to cost objects, using activity cost drivers.

III. Determining the cost driver for each major activity

This phase is of great importance because the efficacy of ABC system is based heavily on the type and number of cost drivers selected. Since these latter will be used to link the activities to cost objects, a poor choice of the appropriate cost driver will distort the cost of cost objects, which leads to wrong decision-making.

Several factors must be borne in mind when selecting a suitable cost driver. First, it should provide a good explanation of costs in each activity cost pool. Second, a cost driver should be easily measurable; the data should be relatively easy to obtain and be identifiable with products (Drury, 2012, p: 258). The selection of an activity cost driver should balance between accuracy and the cost of measurement (Kaplan & Cooper, 1998, p: 95).

Turney argues that the selection of the appropriate cost driver in the ABC system is driven by two main questions. The first is how many cost drivers does the system need? And the second is what type of cost driver do we should choose for each activity? (Turney, 1996, p: 56). Yet, it could be argued that the choice of the required number of cost drivers depend largely on the number of activities or activity cost pools selected in the activity identification step. Although we can find several cost drivers possible to use for a given activity, only one driver will be used for the purpose of determining the costs of cost objects. So, the search for the optimum number of cost drivers does not occupy great importance, yet the choice of the appropriate type of cost driver for each activity is a vital decision.

In contrast, traditional systems use only volume-based cost drivers. ABC systems use both volume-based and non-volume-based cost drivers (Drury, 2012, p: 255).

Volume-based cost drivers assume that the overhead consumed by-products is highly correlated with the number of units produced. Typical volume-based cost drivers used by traditional systems are units of output, direct labor hours and machine hours. These cost drivers are appropriate for measuring the consumption of expenses such as machine energy costs and depreciation related to machine usage. According to Drury, the ABC system also can use volume-based drivers at the unit-level activities because they are performed each time a unit of the product or service is produced (Drury, 2012, p: 255).

In contrast, non-volume related activities are not performed each time a unit of the product or service is produced. For these activities, ABC system use non-volume-based cost drivers. ABC system designers can choose from three different types of activity cost drivers: transaction, duration, and intensity (Kaplan & Cooper, 1998, p: 95).

Transaction drivers, such as the numbers of setups, receipts, and products supported, count how often an activity is performed. Transaction drivers are the appropriate measure for the batch-level activities because the same quantity of resources is required every time an activity is performed (Kaplan & Cooper, 1998, p: 95-96). However, if the variation in the amount of resources required by individual cost objects is not great, transaction drivers will provide a reasonably accurate measurement of activity resources consumed. If this condition does not apply then duration cost, drivers should be used (Drury, 2012, p: 258).

Duration drivers include the amount of time required for an activity to be done, such as setup hours, inspection hours, and direct labor hours. This type of driver is preferred when the amount of time in an activity defer significantly from one output to another (Kaplan & Cooper, 1998, p: 96). In this case, the use of transaction drivers will assign the cost of that activity equally to those different outputs, which may over cost simple products and under cost complex products. The duration drivers, however, can resolve this issue because they respect the variations that exist between the different outputs of the activity. Nevertheless, there are some cases where the resources needed for an activity are differentiated in terms of price and variability, for example, simple and skilled employees and different types of equipment. The use of duration drivers in this situation will result in the same cost for each hour of time, even if this ignore the

differences between types of resources used, and that may lead to inaccurate cost information.

As a solution to this problem, another type of driver may be used, which is the **Intensity driver.** Kaplan and Cooper state that an intensity driver is the direct charging for the resources used each time an activity is performed. They claim that intensity drivers should be used only when the resources associated with performing an activity are both expensive and variable each time that activity is performed (Kaplan & Cooper, 1998, p: 97).

The selection among types of cost drivers to assign an activity cost should contest with the cost hierarchy of that activity. Volume-based drivers can be used to drive unit-level activities, but they cannot be used for batch-level activities. Batch-level activity costs might be allocated using transaction drivers (number of setups) or duration drivers (setup hours). However, the use of transaction drivers to allocate product sustaining-level activity costs may distort cost information because they assume that the same amount of resources is consumed every time the activity is performed. Duration and intensity drivers, however, are more accurate to allocate product sustaining-level activity costs; but also, they are expensive to implement (Kaplan & Cooper, 1998, p: 98). A balance between the accuracy level desired and the cost of implementing a given type of cost driver.

IV. Assigning the cost of activities to cost objects

The final step for an ABC system designing is to assign costs of activities or activity cost pools to all kinds of cost objects (Products, services, customers, projects, business units etc.), the appropriate activity consumption cost drivers (Blocher et al., 2010, p: 132). This step is simple but important. Many practitioners of activity-based costing skip it and focus only on how to make activities and processes more efficient. They have not asked themselves whether these activities or processes are worth doing. Is their organization getting paid adequately for performing these activities? Answering that question requires that activity costs be linked to the products, services, and customers who are the ultimate beneficiaries of the organization's activities (Kaplan & Cooper, 1998, pp: 97-98). Addressing this issue leads naturally to the fourth and final step in building an ABC model.

Applying cost drivers to allocate activity costs to cost objects means that the cost driver must be measurable in a way that enables it to be identified with individual products. The ease and cost of obtaining data on cost driver consumption by-products is, therefore,

a factor that must be considered during the third stage when an appropriate cost driver is being selected (Drury, 2012, p: 259).

Section Three: Activity-based Management

After Activity-based costing ABC has emerged in the1980s, many academics and practitioners have argued that it was one of the most important innovations in management. At first, activity-based costing was used as a costing method to trace costs of resources to cost objects, using activities and their cost drivers as a base. By the time, however, academics and practitioners who observed or participated in ABC implementations found that there were other advantages for using such ABC systems, such as the capability to better manage costs and activities than just an improved method to calculate costs. These conclusions led to the emergence of other use of "activity-based" analysis in management. This use was called activity-based management ABM. In this section, ABM will be discussed by answering these questions:

- What is ABM? And what is the relationship with ABC?
- How to implement ABM system?
-

A- The concept of Activity-based Management:

I. The two-dimensional activity-based costing and the emergence of Activity-based management

Because of the lack of cost information given by traditional cost systems, the initial intent of ABC was to improve the assignment of costs to cost objects. Assigning costs of resources to activities and determining activity cost drivers as a way to calculate costs of cost objects, has shown that those activities can be managed clearly. The CAM-I conceptual design of "Cost Management Systems" showed that ABC could provide information about both costs and processes. This approach was developed by TURNEY (1996), who presented "The tow dimensional ABC" model as illustrated in Figure 1.6

The first dimension is the cost assignment view. It reflects the need for organizations to assign costs to activities and cost objects (Turney, 1996, p: 81). The objective of the cost dimension is improving the accuracy of cost assignments (Hansen & Mowen, 2006, p: 549), and analyzing critical decisions include pricing, product mix, sourcing, product design decisions, and setting priorities for improvements efforts

(Turney, 1996, p: 81). It is the original aim of the ABC system, provide accurate cost information. However, if managers want to influence these costs, improvement decisions have to be made, and that requires another type of information, which can be found in the second view.

The second part of ABC is the process view. It reflects the need of organizations for information about events that influence the performance of activities and activity performance (Turney, 1996, p: 81). The process dimension provides information about what activities are performed, why they are performed, and how well they are performed (Hansen & Mowen, 2006, pp: 549-550). The objective of this dimension is to provide the ability to engage in and measure continuous improvement.

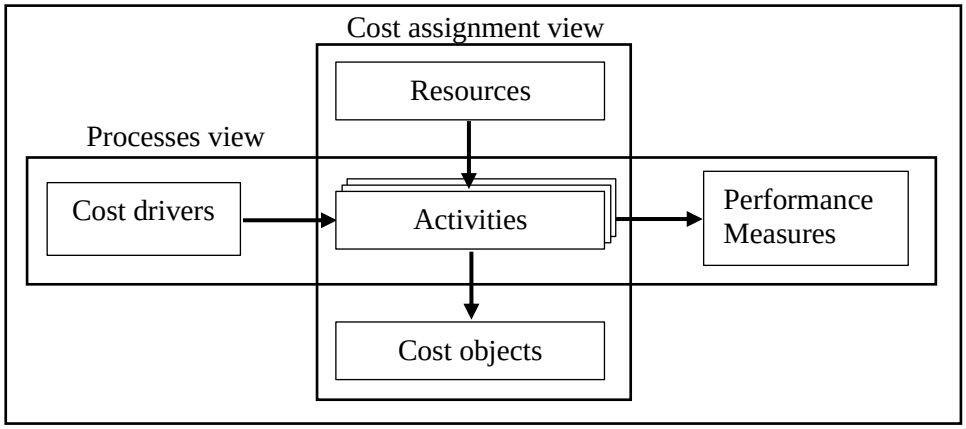

Figure 1. 6: The tow dimensional ABC

(Turney, 1996, p: 81)

The vertical view enables to answer the question, what things cost? Whereas the horizontal view focuses on why things cost (Cokins, 2001, p: 49).

While the horizontal process view represents- according to Turney - Activity-based management ABM, the whole two-dimensional model is called Activity-based cost Management ABC/M, which combine both ABC and ABM (Turney, 1996, p: 140). The term ABC/M is used by Cokins in his book Activity-based cost management: make it work, issued in 1996 (Cokins, 1996, pp: 40-41); he argued that ABC/M is a middle between ABC and ABM, it is focusing only on understanding the cost structure, cost behavior, and economics of an organization to improve operations. While ABM - according to him always- expands to make proactive strategic and operating decisions based on data provided by ABC and ABC/M. But later in his third book in 2001 (Cokins, 2001, p: 326), he referred to ABC/M as the combination of activity-based costing and

activity-based management. Thus, the two-dimensional model is called Activity-based Cost Management ABC/M.

II. Activity-based management concept and objectives.

Using Activity-based costing system provides more accurate and timely information about costs of activities and cost objects. But the issue to the manager is how to influence those costs; this is what ABM is about. ABM is the entire set of actions that can be taken, on a better-informed basis, with activity-based cost information (Kaplan & Cooper, 1998, p: 137). ABC and ABM are made for each other (Turney, 1996, p: 139).

According to Kinney and Raiborn (2011), ABM includes a variety of concepts that help companies to produce more efficiently, determine costs more accurately, and control and evaluate performance more effectively (Kinney & Raiborn, 2011, p: 114). At the same time, CAM-I defines ABM as "a discipline that focuses on the management of activities as the route to improving the value received by the customer and the profit achieved by providing this value. This discipline includes cost driver analysis, activity analysis, and performance measurement. ABM draws on ABC as its major source of information" (Raffish & Turney, 1991, p: 01 **In.** MacArthur, 2000, p: 404).

From the CAM-I definition, we can state that ABM has two main goals. The first goal of ABM is to improve customer value, while the second is profitability enhancement. To improve customer value, the organization managers have simply to meet their wants. But what it concerns more -especially for stockholders-, is how to meet what customers profitably. To reinforce this, ABM adheres to the belief that managing activities is the route to profitably improving customer value (Turney, 1996, p: 141).

In order to accomplish its objectives, ABM -according to Kaplan and Cooper (1998) - use two complementary applications, operational and strategic ABM (Kaplan & Cooper, 1998, p: 137). Operational activity-based management is about how to do things right. It is concerned with increased efficiency, lower costs, and enhanced asset utilization in short. Thus, the benefits from operational ABM can be measured by reduced costs, higher revenues, and cost avoidance.

Strategic ABM, on the other hand is about doing the right things. It attempts to alter the demand for activities to increase profitability while assuming, as a first approximation, that activity efficiency remains constant. Strategic ABM also includes

decisions about product design, product development, and supplier relationships that reduce the demand for organizational activities.

To implement an ABM system, only the first three of the four stages for designing an ABC system are required. They are (Drury, 2012, p: 549):

- Identifying the major activities that take place in an organization (i.e. activity analysis);
- Assigning costs to cost pools/cost centers for ch activity;
- Determining the cost driver for each major activity.

Activity-based management seeks to improve activity performance. To do that, there are three main tools that ABM use to better identify improvements opportunities. Those components will be discussed in the next part of this section.

B- Components of Activity-based Management system

Activity-based management ABM There are three main components on which ABM system is based (Turney, 1996, p: 145). Hansen and Mowen (2006) use the term Process value analysis (PVA) to characterize the components of ABM. PVA moves activity management from a conceptual basis to an operational basis (Hansen & Mowen, 2006, p: 550). Those components or steps are:

- Activity Analysis to identify opportunities for improvements;
- Cost driver analysis to highlight the root causes of activity costs; and
- Performance measurement analysis.

I. Activity Analysis:

To be competitive, an organization must assess each of its activities based on its need by the product or customer, its efficiency, and its value content. A firm performs an activity for one of the following reasons (Blocher et al., 2010, p: 139):

- It is required to meet the specification of the product or service or satisfy customer demand.
- It is required to sustain the organization.
- It is deemed beneficial to the firm.

Activity analysis according to Hansen and Mowen (2006), is the process of identifying, describing, and evaluating the activities an organization performs. Activity

analysis should produce four outcomes: (1) what activities are performed, (2) how many people perform the activities, (3) the time and resources required to perform the activities, and (4) an assessment of the value of the activities to the organization, including a recommendation to select and keep only those that add value (Hansen & Mowen, 2006, p: 550).

Turney (1996) stated that the analysis of activities involve: identification of nonessential activities; analysis of significant activities; comparison of activities to the best practice; and examination of the links between activities (Turney, 1996, p: 146).

1- **Identify nonessential activities:** this means grouping activities into two categories, value-added and non-value-added activities. If an activity is essential to the customer, or to the functioning of the organization, it is considered as a value-added activity. Otherwise, all the other activities are non-value added. Moreover, Hansen and Mowen (2006) argue that it is possible to identify three conditions, which if simultaneously met, are sufficient to classify a discretionary activity as value-added. These conditions are as follows (Hansen & Mowen, 2006, p: 551):
    - The activity produces a change of state;
    - The change of state was not achievable by preceding activities; and
    - The activity enables other activities to be performed.

    Non-value-added activities are unnecessary and are not valued by internal or external customers. They are often those that fail to produce a change in state or those that replicate work because it wasn't done correctly the first time.

    Classification of activities into simplistic value-added and non-value-added can be confusing in some cases. For example, Kaplan and Cooper (1998) state that most advocates of value-added coding schemes intuitively classify setups as a non-value-added activity. But without setups, the plant can only produce a single product. In parallel to with this, there is employee reaction. In general, employees get annoyed when informed they are performing a non-value-added activity (Kaplan & Cooper, 1998, p: 158). As a solution, they propose another viewpoint of categorizing activities, using the current efficiency of the activity. They give five groups of activities (Kaplan & Cooper, 1998, p: 138):

    i. Highly efficient, little (< 5%) apparent opportunity for improvement
    ii. Modestly efficient, some (5-15%) opportunity for improvement

iii. Average efficiency, good opportunities (15-25%) for improvement
iv. Inefficient, major opportunities (25-50%) for improvement
v. Highly inefficient, perhaps should not be done at all; 50-100% opportunity for improvement

This leads us to determine which activities must be considered as a highly efficient, or those that are not significant to be analyzed.

2- **Analyze significant activities:** In some organizations, a large number of activities can be faced. It will be costly and time-consuming task trying to analyze all of them at the same time. The key is then to focus on the most significant activities that are important to customers or operating the business. Moreover, these are the activities that provide the significant opportunities for improvement. The Pareto (20% of the activities causes 80% of the total cost) analysis can be used to determine the significant activities (Turney, 1996, p: 146).

However, there are some points that must be taken into consideration when deciding what activities are worth analyzing. Lorino (1991) suggest that before excluding any activity from being analyzed, by relying only on the resource consumption viewpoint, we should consider (Lorino, 1991, pp: 60-62):

- Some activities may consume a relatively low amount of resource currently. But it is growing with time, so the degree of growth should be predicted.
- Some activities such as supervision, Planning, and Budgeting may have a low relative weight in each department, however, as they exist in all departments, they will have a considerable total weight. For example, if an activity cost represents 04% in each department, it will be then 04% of total cost. While one another activity consumes 25% of a department resources, may not exceed 0.5% of the total resources' consumption.
- Cost should not be the only standard in the selection. In some of the activities with a weak resource consumption, may need a considerable time to perform.

Figure 1.7 shows that in some cases, a mix standard is applied in order to determine whether an activity is significant or not, by combining resource consumption with the value perceived by customers.

		Customer demand	
		YES	NO
resource consumption	HIGH	Significant	Significant
	LOW	Significant	*Not* Significant

Figure 1. 7: Mix selection standard of activities

(Ravignon et al., 2003, p: 240)

3- **Compare activities with the best practice:** Being a value-added or significant activity, does not mean that it is efficient or of good quality. All activities should be compared with similar activities in another company or within the organization that performs the best in class. Benchmarking should be carried out for both value-added and non-value-added activities. Comparing an activity with a good practice helps to determine the scope for further improvement. The activities should be measured based on factors, e.g. quality, lead-time, flexibility, cost, and customer satisfaction. Then, each activity should be rated against an identified best practice (Turney, 1996, p: 146).

Obtaining information from other companies is quite difficult. Therefore, benchmarking within the company or with the best practice is mostly used in real-life situations. For example, taking customer orders is an essential activity, it can be performed manually. The best practice, however, uses electronic data interchange that costs less per transaction, has a lower error rate and provides a faster service. This clearly shows that there is room for improvement over manual order taking (Turney, 1996, p: 146).

4- Examine the links between activities: Activity analysis should focus not only on activities as separated units; activities work together in a chain to meet common goals. The links of this chain must be constructed to minimize time and duplication of work. According to Porter (1998), linkage between activities imply that a firm's cost or differentiation is not merely the result of efforts to reduce costs or improve performance in each activity individually (Porter, 1998, p: 49).

The product design process, for example, in the traditional approach, activities are performed serially. Product designers prepare the product specifications without

consulting production. When the design is finished, production tries to manufacture the product (often with difficulty). This approach is repetitive, time consuming, and costly. Concurrent engineering approach, however, is better than the traditional approach of product design and development. In this approach, product design, manufacturing, marketing, and procurement work together toward a common goal (Turney, 1996, p: 146). The examination of the links between activities while analyzing activities, leads to better understand how really the work is done in the organization.

Activity analysis is the important component or step for the ABM approach; it can show to managers what actions they should do, what decisions they have to make, in order to improve performance or reduce costs. Figure 1.8 summarize the tasks of which activity analysis is based on.

II. Cost driver analysis

Activities require inputs (resources) to be consumed in order to produce outputs. An activity can be measured either by the number of times the activity is performed, the number of its outputs, or by the amount of time spent in performing that activity, or other measures, as we seen in ABC system construction. Activity drivers can be used as quantifiable measures to assign activity costs to cost objects. In ABM approach, however, there is a deeper meaning of cost driver. To manage activity costs and performance, the factors that cause activities to be performed in the first place, need to be identified. Cost driver analysis identifies these causal factors.

Activity drivers may not and usually do not correspond to the root causes of activity costs; rather, they are the consequences of the activity being performed (Hansen & Mowen, 2006, p: 550). According to Cokins (2001), cost drivers and activity drivers serve different purposes. Activity drivers are output measures that reflect the usage of each work activity, and they must be quantitatively measurable. A cost driver instead, has not to be necessarily described in numbers. The term describes the larger scale causal event that influences the frequency, intensity, or magnitude of a workload and, therefore, influences the amount of work done that translates to the cost of the activities (Cokins, 2001, pp: 16-17).

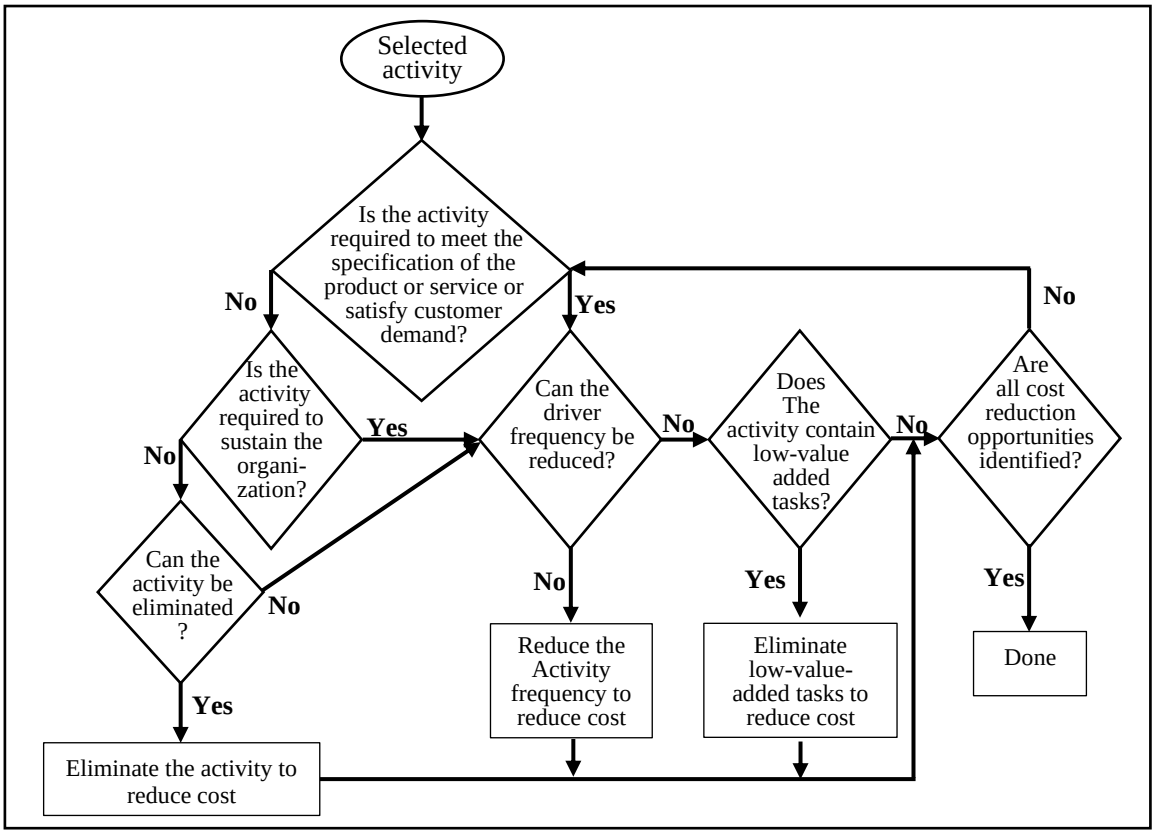

Figure 1. 8: Example of an Activity Analysis

(Blocher et al., 2010, p: 140)

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Understanding and managing cost drivers is crucial to improvement (Turney, 1996, p: 148). The purpose of driver analysis is to reveal the root causes. Thus, driver analysis is the effort expended to identify those factors that are the root causes of activity costs.

III. Performance measurement

The final step in the ABM approach is to measure the performance of the activities and processes. A performance measure describes the work done and the results achieved

in an activity (Turney, 1996, p: 88). Measures of activity performance are both financial and non-financial and focus on three major dimensions : efficiency; quality; and time (Hansen & Mowen, 2006, p: 553).

The efficiency aspect focuses on the relationship of activity inputs to activity outputs. If an organization wants to improve activity efficiency, it simply has to produce the same activity output with lower cost for the inputs used (Turney, 1996, p: 88). The time required to accomplish an activity is important as well. Longer times usually mean more resource consumption and less ability to respond to customer demands. Quality is concerned with doing the activity right the first time it is performed. If the activity output is defective, then the activity may need to be repeated, causing unnecessary cost and reduction in efficiency (Hansen & Mowen, 2006, p: 554).

In ABM approach, the main issue is that a single performance measure will not reflect all the aspects of an organization. Managers may require multiple performance measures, combining both financial and non-financial measures. Some activity cost drivers can be used as performance measures, such as a number of purchase orders, the number of engineering changes, time taken to perform the activity.

Generally, activities involve groups of employees, and the performance measures therefore usually relate to the group rather than the individual and to the process as well as the output or result. Performance measures can lead to motivate employees in the organization to become more interested in how their activities contribute to their organization's performance. Using performance measures gives the employee the tools he needs to evaluate not only how he is currently contributing, but how he might improve his performance to increase that contribution (Gupta & Galloway, 2003, p: 137).

C- The use of Activity-Based Costing and Management ABC/M information

Using activity-based costing and management system ABC/M can provide both financial and non-financial information. The cost assignment view ABC can give accurate information about activities and cost objects costs; it clearly highlights how resources are being consumed by activities and then by the final cost objects. At the same time, the process view of ABC/M system can deliver useful non-information answering the question: why things have costs? By clarifying how business activities and processes are performed, and defining the real causes of costs of these activities. In this element, we try to show how

Activity-based costing and management ABC/M can be used to support some cost management applications which include:

- Cost reduction;
- Activity-based budgeting;
- Product planning and design; and
- Process design and improvement;

I. Cost reduction

The new competitive environment require that companies must focus on their customers, by-products they want delivering on time, and at the lowest possible cost. This fact leads companies to pay more attention to their costs and perform continually cost improvements. Turney (1996) argue that any attempt to cut cost without restructuring work is putting the cart before the horse and are doomed to failure. Many companies tried to cut costs using the traditional accounting approach, but few achieve permanent savings. In some cases, costs have gone up while employees complain about stress and workloads (Turney, 1996, p: 151).

In contrast, the heart of ABC/M is the activity. Cost management focuses on the performance of each activity and its resulting use of resources. Managing activities better is the key to permanent cost reduction. Reducing cost is only one of several focal points of ABC/M. Improving quality, flexibility, and service - the importance of which vary from one business to another - is also central to ABC/M. The second major difference is the way costs are reduced. Cost reduction is best achieved by changing the way activities are used or performed, then redeploying resources freed by the improvement. To show how to reduce costs using the activity-based view, Turney (1996, p: 152) and Hansen and Mowen (2006, p: 553) listed five steps or guidelines:

1- Activity elimination:

As shown in Figure 1.8, if an activity is non-value is by customers or not essential to running the organization, so it is a candidate for elimination to reduce costs. It is possible for example to eliminate material handling activities through changes to the process or products. Here, there are many different possibilities, steps should be taken to ensure that all incoming materials and parts are fit for use. The parts can be delivered directly to the shop floor as needed. Changes can be requested in the vendor’s production process to

improve quality and increase responsiveness. And parts causing quality problems can be redesigned to eliminate those problems (Turney, 1996, p: 153).

Eliminating these activities should reduce the total cost and the cost of products that no longer use those activities.

2- Activity selection

This involves choosing among various sets of activities that are caused by competing strategies. Different strategies cause different activities. Different product design strategies, for example, can require significantly different activities. Activities, in turn, cause costs. Each product design strategy has its own set of activities and associated costs. All other things being equal, the lowest cost design strategy should be chosen (Hansen & Mowen, 2006, p: 553).

Designers of products and processes often have choices among competing activities. This offers a means for reducing cost by picking the lowest cost activity. A designer of an electronic product, for example, may be able to specify the type of activity required for inserting components into circuit boards. Those components can be either manually or automatically inserted. The analysis of both manual and automated insertion activity may show how much every activity di need or resources, and then the low-cost activity is selected (Turney, 1996, p: 154).

3- Activity reduction:

A key element in cost improvement is to reduce of time or effort required to perform an activity, this reduction can come from a process or a product improvement (Turney, 1996, p: 152). This means the reduction of activity frequency or eliminating low-value-added tasks inside the activity, as shown in Figure 1.8 above.

Reduction in time and effort may come not from the activity in question but maybe from the preceding activity. For example, the defect rate of parts received by a machining activity is a cost driver for that activity. Improving quality in the preceding activity reduces the quantity of this cost driver and hence the overall efforts required by the machining activity (Turney, 1996, p: 153).

This approach to cost reduction should be aimed primarily at improving the efficiency of necessary activities or act as a short-term strategy for moving non-value-added activities toward the point of elimination. For example, by improving product

quality, customer complaints should decrease and, consequently, the demand for handling customer complaints should decrease (Hansen & Mowen, 2006, p: 553).

4- Activity sharing:

If a customer has unique needs, it is necessary to perform specific activities for that customer. However, if customers have common needs, it is wasteful not to serve those needs with the same activities. For example, product designers can use the common parts in new product designs. A common part is one that is used in several products to perform the same function (e.g. a gasket used in several car models). The only parts that need to be unique are those that add product-differentiating functions as valued by the customers (Turney, 1996, p: 155).

Sharing an activity increases the efficiency of necessary activities by using economies of scale. Specifically, the quantity of the cost driver is increased without increasing the total cost of the activity itself. This lowers the per-unit cost of the cost driver and the amount of cost traceable to the products that consume the activity (Hansen & Mowen, 2006, p: 553).

Process designers can also cut costs by grouping products into work cells. This is possible when products have similar designs (members of a product family) and when the manufacturing process is sufficiently flexible to handle any differences (Turney, 1996, p: 156). Costs can be reduced because the products in the cell share activities such as supervision, testing, training, scheduling, material handling, storage, and documentation.

5- Redeployment of unused resources:

In the final analysis, cost can only be reduced if resources are. Reducing the workload of an activity does not, by itself, reduce the equipment or number of people dedicated to that activity. There must be a conscious management decision to deal with the freed resources. This can be done by growing the business to take up the slack, redeploying the resources to other activities, or removing them from the company. ABC/M can be used to determine the type and amount of unused resources. Resource plans based on the ABC information then become the basis for redeployment (Turney, 1996, p: 156).

II. Activity-Based Budgeting ABB:

Traditional budgeting is consistent with the traditional approach of management accounting in general. It assumes that the demand for resources is created by the volume of output. Drury (2012) argue that this approach can work well only with unit-level activity costs where the consumption of resources varies proportionately with the volume of the final output of products or services (Drury, 2012, p: 377). However, this idea may not be appropriate for overheads and support activities, because the traditional approach does not show clearly the cause and effect relationships between resource consumption and final outputs. Then, using traditional budgets provide little relevant information for managing the costs of support activities.

With ABC system existing in the company, a cause and effect relationship between resources and final products is shown with the guidance of the activities performed. Activities consume resources, and final products create the demand for performing those activities. Using this approach in the budgeting process led to the emergence of the so-called Activity-based budgeting ABB.

Activity-based budgeting is simply activity-based costing in reverse (Kaplan & Cooper, 1998, p: 303). According to Brimson and Antos (2000), activity-based budgeting is the process of planning and controlling the expected activities of the organization to drive a cost-effective budget that meets forecast workload and strategic goals (Brimson & Antos, 2000, p: 460).

The purpose of ABB is to determine of resources needed to perform activities required to meet the budgeted production and sales volume. ABB start with cost objects, then determines the activities needed to be performed, and finally, uses that to estimate the amount of resources required. Kaplan and Cooper (1998) state five steps which Activity-based budgeting follows as follows:

1- Estimation of next period's production and sales volumes:

The starting point of ABB is to estimate the budgeted production and sales volumes for individual products and customers. The estimates should include the total production of products and sales to customers, as well as details on the production and sales ordering processes. For example, the budget should include the number of production runs for each product, the frequency of materials orders and receipts, the number of customer orders, the method of shipment, and so on (Kaplan & Cooper, 1998, 304).

2- Forecasting of the demand for organizational activities:

The second step to implement ABB is the identification of activities that are necessary to produce and sell the products and services and service, and the derivation estimated quantity of activity cost drivers for each activity (Drury, 2012, p: 378). This process should be identical to that used in traditional budgeting for calculating budgets for purchases of materials, the utilization of machines, and the supply of direct labor based on the forecasted production mix for the upcoming year. ABB extends this exercise by forecasting the demands for all the indirect and support activities and their cost driver as well (Kaplan & Cooper, 1998, 305).

3- Calculation of the resource demands to perform the organizational activities:

The third stage is to estimate the resources that are required for performing the quantity of activity cost drivers demanded. Particularly, estimates are required of each type of resource, and their quantities required, to meet the demanded quantity of activities (Drury, 2012, p: 378). With fungible resources, those that support multiple activities, the total demand becomes the sum of the resource demands for all the activities performed by the fungible resources (Kaplan & Cooper, 1998, 307).

Cokins (2001) argue that when estimating the outputs demand of resources in term of volume and mix, managers are only determining the capacity requirements of the resources (Cokins, 2001, p: 305). The next step is to determine the actual amount of resources to be supplied.

4- Determination of the actual resource supply to meet the demands:

Estimating actual levels of resource expense cash outflows might be complex because resources come in different levels. That is, resource expenses do not immediately vary with each incremental increase or decrease in end-unit volume (Cokins, 2001, p: 306). In this stage, the resources demanded (calculated in the third stage) are converted into an estimate of the total resources that must be supplied for each type of resource used by an activity (Drury, 2012, p: 378).

Here, managers have to treat each type of resources separately; for flexible resources such as energy or hour paid labor, the quantity of supply can be matched to the quantity demanded. For other types of resources, however, the quantity of supply cannot be matched exactly or even closer to the quantity of resources demanded. So the manager need to determine the actual resources to be supplied. For example, the calculation of resources demand may result in the acquisition of a new 1.6 machine, but as it is quite not practical,

the company has to acquire two machines instead. Kaplan and Cooper (1998) suggest that the role of ABB is to attempt to approximate future resource supply, not to try to model it perfectly (Kaplan & Cooper, 1998, 310).

5- Determination of activity capacity:

In the final stage is to compare the estimated quantity of resources to be supplied for each resource with the quantity of resources that are currently committed. If the estimated demand for a resource exceeds the current capacity additional spending must be authorized within the budgeting process to acquire additional resources (Drury, 2012, p: 379). Otherwise, if the demand for resources is less than the planned supply, management decisions have to be taken in order to either redeploy or reduce those resources that are no longer required.

The purpose of the budgeting process is to determine what and how much resources are needed for the next period. Traditional budgeting is based on the past information about how resources were consumed, it uses the current level of expenses as a basic data, and try to forecast the needed resources for the next period. Activity-based budgeting instead, is based on the future information about the level of production and sales, then the determination of what and at which frequency activities should be performed to achieve that level. At this point, the organization can know what resources are needed to be supplied.

According to Kaplan and Cooper (1998), it is not easy to execute well an ABB process in practice. More details must be specified about how to meet the demand of production and sales, about the essential efficiency of all organizational activities, and about the spending and supply pattern of individual resources. If an ABB process is executed effectively, however, managers can have better control over their cost structure, particularly more control on fixed costs (Kaplan & Cooper, 1998, 312).

III. Product development and design:

A significant portion of the profits that a product generates over its life is determined before the product reaches the market (Davila & Wouters, 2004). The aim of the product development stage is to enable designing features that give the product an advantage over competitor's products; this advantage could be extra features (differentiation strategy), or cost advantage (cost leadership strategy). In both cases, the organization needs to affect the costs that will shape profit margins. Product design affects all the revenue sides

significantly as technological performance, customer request, and timely market introduction before the sale stage. Costs also follow a similar model; eighty to ninety per cent of the costs are committed during product development (Cooper & Slagmulder, 1997, p: 72).

The main issue in the product development stage is how to design a product at the lowest cost possible. To achieve this goal, engineers must have accurate cost information. As argued before in section one of this chapter, traditional costing systems do not translate the true picture of the resources consumption; the use of volume-based allocation bases distorts product costs. By consequence, this leads to a subjective analysis of design for manufacturability, product profitability, outsourcing, and make or buy decisions (Gupta & Galloway, 2003, p: 134). Without a true picture of accurate costs for each product, it is extremely difficult to evaluate whether or not a product is contributing to the profitability of the firm. Moreover, if evaluating an entire product is difficult, then evaluating specific design characteristics becomes impossible.

Using ABC/M information may show a clearer picture of how product costs are structured and can describe cost behavior inside the activities, by using many levels of cost drivers. Thus, an ABC/M system can provide useful vision into product design decisions to obtain lower costs (Gupta & Galloway, 2003, p: 134). Kaplan and Cooper (1998) mentioned that some electronic assembly companies like Hewlett-Packard and Tektronix used their initial ABC models to enhance the design decisions of their product engineers. By understanding batch and product-sustaining costs, engineers could incorporate the economics of using existing parts, especially those ordered and used in high volumes, into their design decisions (Kaplan & Cooper, 1998, 214).

However, using ABC to influence product design decisions, according to Kaplan and Cooper (1998), requires a balance between providing cost information accuracy and the understandability of cost information to product engineers. For example, consider a choice between two alternative activity cost drivers used in electronic printed circuit manufacture: insertion hours and the number of insertions. If each insertion process of a certain type (say through-hole insertion, or surface mount) takes the same amount of time for all components, the two drivers will report identical product costs. But most engineers understand a number of insertions a lot easier than insertion hours since the number of insertions is identical to the number of components in their circuit design. Therefore, the driver number of insertions will send a clear message that every additional component adds

manufacturing cost, whereas the driver insertion hours requires that engineers will likely have to convert back to a number of insertions to know how they can reduce product costs(Kaplan & Cooper, 1998, 215).

Product development and design should be a team process with input from many perspectives such as marketing, finance, and operations. The implementation of ABC/M provides an opportunity for stronger communication between accounting and the design team.

IV. Process design and improvement:

The new approach to the organization's performance improvement must include both how an organization is viewed and structured and how it can be improved. The organization must be viewed not in terms of functions, divisions, or products but of key processes. Thus, performance improvements should be applied to these processes by employing whatever innovative technologies and organizational resources are available (Davenport, 1993, p: 01). A process approach to the organization implies paying important attention to improving how the work is done, in contrast to a focus just on which products or services are delivered to customers.

For the purpose of process design and improvement, the manager should first understand how the work is done inside the organization, what activities and processes are being performed and of course, at what costs; the costing system of the organization is meant to fill this last need by providing cost information flows from resources to final products. The information provided by traditional costing systems are not only weak in term of accuracy but also, this information is presented in a hierarchic vertical view, with no regard to the activities and processes done in order to produce and deliver final products to customers.

The activity-based costing/management ABC/M approach offers significant insight into equipment and process decisions (Gupta & Galloway, 2003, p: 135). The approach involves a process perspective, as it is not possible to understand the resource needs of a product or set of customers without examining the production process. Many companies have discovered that they can use the accurate product-cost information provided by ABC/M not only to determine which products or customers are profitable or unprofitable but also to improve a given process. According to Davenport (1993), the improvement opportunities in the context of ABC/M arise in two ways (Davenport, 1993, p: 143):

- The process includes analysis of cost drivers and non-value-added activities; and
- The information produced can be used by employees and management to measure continuous improvement.

In most organizations, and for the performance management issue, cost management systems can play a major role. For this purpose, ABC/M may provide a model for process performance-measurement systems that need to be developed for new processes. For example, ABC/M systems include nonfinancial performance measures and feedback for continuous improvement, which are important aspects of innovation performance measurement (Cooper & Kaplan, 1991 **In**. Davenport, 1993, pp: 143-144).

In ABC/M approach, there are two dimensions of analysis (as shown at the beginning of this section). While the vertical dimension is concerned with cost assignment from resources to activities and then to final products, the horizontal view tries to measure the organization's performance by activity and cost driver analysis. This approach can help in understanding existing processes for the purpose of design and improvement.

Gupta and Galloway (2003) cited some researches that described the role of an advanced ABC/M system, which can analyze the determinants of activities in terms of product and process design features, offers valuable information to the product designers by providing the cost implications of alternative design choices. The system can isolate the various factors that are under the control of design engineers and that can be used to influence manufacturing costs. Moreover, without such a system, companies tend to add more features and design products that are more complex because the price and market share advantages are perceived to outweigh the additional costs of designing, manufacturing and supporting complex products (Gupta & Galloway, 2003, p: 135).

However, even with these advantages of using ABC/M in a process management context, Davenport (1993) point out that only a few companies that have tried this approach, have achieved major process improvements; instead, they can achieve only incremental improvement. In an ABC/M system the analysis should be done to the lowest level of activity within the organization. Changes at this level, unless they lead to broad product-line restructuring, are likely to produce incremental change at best (Davenport, 1993, p: 143).

Using Activity-based costing and management ABC/M information can lead to a better understanding of costs in the organization, through the cost assignment view, ABC can provide accurate information about how resources are being consumed by the activities, and then, allocate activities costs to final cost objects in a cause and effect way, regarding to their actual use of those activities. On the other hand, the horizontal ABM view show the "why analysis" of costs; by analyzing the activities and their cost drivers, performance can be well measured. Thus, decisions about cost reduction using ABC/M approach become easier; the manager has the choice between many possible actions in order to drag the costs down by either eliminating non-added activities, selecting those activities with the lowest costs, reducing unneeded work in the activity to get is more efficient, or sharing the common activities; then redeploying the unused resources. Another use of ABC/M is for budgeting purpose, Activity-Based Budgeting ABB uses the reversed model of ABC in order to estimate the amount of resources needed to be supplied based on the next period's production and sales volumes. Then, ABB forecast the demand for organizational activities, and calculate the resource demands to perform them, in order to determine the actual resource supply. ABB represent the future scope of ABC/M approach. Furthermore, ABC/M approach can be used as a source of useful information for the purpose of product design and development, and also for process Improvement.

Chapter Two: The balanced scorecard

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In the past, organizations depended only on financial measures to evaluate their performance, because at that time the environment was stable with no challenges and difficulties. However, as customers became increasingly aware of the requirements of providing products and services with more specifications, and the rapid developments in the business environment which is characterized by complexity and continuous change, the success in this environment requires a major challenge. The traditional concept of performance measurement, which focuses on the financial metrics, is no longer able to give the full picture of the performance of the organization.

There is an urgent need for more effective, appropriate, creative and innovative tools to address these developments with new thinking and direction to face these challenges. Many organizations have adopted performance management systems that use a mix of financial and non-financial measures which have proven their worth in measuring and evaluating performance. one of the most important of these tools is the Balanced Scorecard, which is one of the modern methods used to translate an organization's strategy into a set of measurable objectives that link that strategy to the activities that employees execute on a daily basis.

In this chapter, the Balanced Scorecard will be discussed in three sections. The first section addresses the balanced scorecard concept, its roles, its importance and evolution. While the second section is devoted to the explanation of the four perspectives of the balanced scorecard. Finally, in the third section, the strategic use of the balanced scorecard will be discussed by talking about the strategy map.

Section One: The concept of Balanced Scorecard

The emergence of the Balanced Scorecard as we know it today was in 1992 with the first article of professor Robert Kaplan and professor David Norton. They argued that a firm could not measure its performance by relying only on financial measures. Managers should have a comprehensive view of the firm performance by using financial measures together with operational measures from three other major dimensions, which are according to Kaplan and Norton: customer satisfaction, internal processes, and the firm's innovation and improvement. This approach was called the Balanced Scorecard BSC.

This section will try to present the concept of the Balanced Scorecard by discussing:

- Origins, and a brief history of the Balanced Scorecard;
- The Balanced scorecard definition;
- The importance of the Balanced Scorecard;
- The Balanced scorecard evolution.

A- Origins, and a brief history of the Balanced Scorecard:

The traditional performance measurement systems focus on the organization's financial performance measures, which leads to a state of incompatibility between the strategy of the organization and the managers perspective to the performance measurement, as well as it does not reflect the value of most intangible assets, which represent an important aspect of the market value of the organization, such as knowledge and skill of employees and managers, management experience, information technology and others . In the 1980s, financial standards were widely criticized because the sole use of the financial information to measure the organization performance directs the manager's energy to improve short-term financial results, at the expense of the organization's long-term objectives. Because of all these criticisms, both academics and practitioners have tended to develop and innovate future performance measurement systems that expand the scope of interest to the non-financial measures.

The Balanced Scorecard as we know it today was first introduced in the early 1990s by Robert Kaplan and David Norton, after a one-year study of 12 institutions in Canada and the USA to offer them with a new approach of performance measurement. During

the study, they noted that financial indicators are no longer effective for modern organizations, and that the reliance only on financial measures negatively impacts their ability to create value. This study was culminated by the publication of their first article in 1992 "The Balanced Scorecard—Measures That Drive Performance." (Niven, 2014, p: 01).

At the time the Balanced Scorecard has emerged, the business environment was characterized by many changes and developments, which affected various aspects of the organization's performance, resulting in a trend towards the search for a new approach to performance measurement and strategic management (Niven, 2008, p:12). The rise of the importance given to the customers in the organization to maintain its survival in a new competitive environment. The main objective is to serve and retain customers, which increased the attention to customer profitability analysis and the measurement of his loyalty. The organization should focus on how to make its customers more satisfied by offering diverse and innovative products, while facing the challenges of cost and prices reduction.

With the first article of Kaplan and Norton in 1992, the adoption of the Balanced Scorecard in has spread in many companies in the United States, Canada, Europe and then the rest of the world. At the same time, academic researchers have become increasingly interested in the Balanced Scorecard, as it has become an important subject in the field of management and managerial accounting.

B- The Balanced Scorecard Concept:

When searching an exact definition of what comprised the Balanced Scorecard in the early writings, we find it unclear and sparse (Cobbold & Lawrie, 2002, p:01). In their first article, Kaplan and Norton described the Balanced Scorecard as a tool which includes both financial and non-financial measures; they suggested that operational measures can lead to better financial performance in the future (Kaplan & Norton, 1992, p: 71). The Balanced Scorecard can provide managers with useful information by answering four main questions (Kaplan & Norton, 1993, p: 134):

- How do customers see the organization?
- What must the firm excel at?
- Can the firm continue to improve and create value? And,
- How do the shareholders see the firm performance?

The Balanced Scorecard was presented -at that time- as a new framework of performance measurement as shown in Figure 1-1. The early BSC was like a "four boxes" performance measurement tool with no link to the strategy of the organization. Later writings of Kaplan and Norton showed that the Balanced Scorecard could be used as a strategic management tool, by linking the performance measures to the organization's strategy (Kaplan & Norton, 1996b, p:76).

The Balanced Scorecard provides managers with a comprehensive framework that translates an organization's vision and strategy into a coherent set of performance measures (Kaplan & Norton, 1996a, p: 24). Smith gives a definition of BSC regarding its role as a tool for strategic management, he stated that " A Balanced Scorecard is a management tool that provides senior executives with a comprehensive set of measures to assess how the organization is progressing toward meeting its strategic goals" (Smith, 2007, 166).

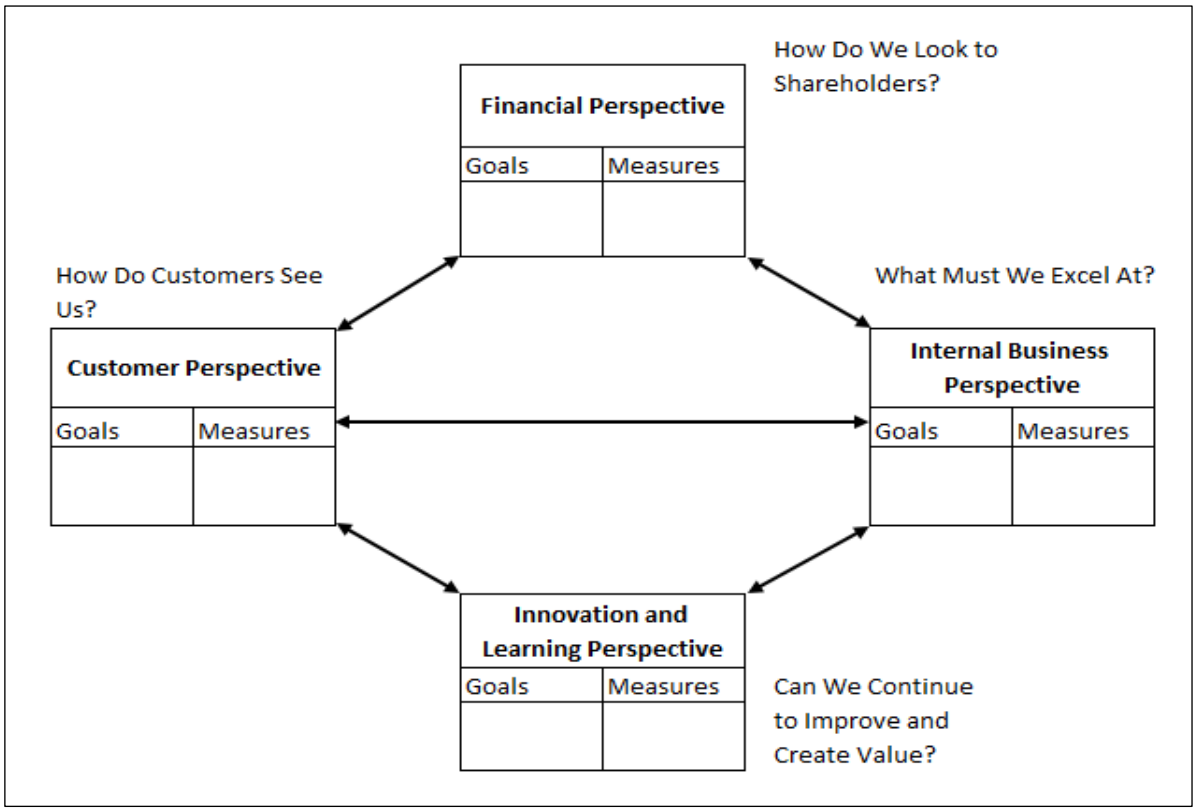

Figure 2. 1 : The Balanced Scorecard Links Performance Measures

(Kaplan & Norton, 1992, p: 72)

The Balanced Scorecard is not just a single tool that links performance measurement to the firm's strategy, but it is a whole management system. According to

Niven 2014, BSC is a system designed to help any organization effectively execute its strategy, is comprised of four unifying elements (Niven, 2014, p:08):

- Objectives
- Measures
- Targets
- Strategic initiatives

The Balanced Scorecard is a strategic management approach that contributes to the achievement of the organization's strategic objectives by translating its vision into a coherent set of financial and non-financial performance measures and facilitating the process of evaluating the organization's performance through these standards. Or is a strategic tool to improve and improve performance within the organization in order to reach the highest level of achieving the strategic objectives by giving a clear picture of performance in the present and future.

C- The importance of the Balanced Scorecard

The Balanced Scorecard is of great importance; it helps organizations to make their strategies more understandable by giving them a clear and comprehensive picture of their financial and non-financial health. Thus, identifying strengths and weaknesses in their financial and non-financial performance and taking the necessary action to achieve key success factors. According to Niven, the Balanced Scorecard draws its importance from several reasons (Niven, 2005, p: 02):

- The traditional reliance on financial measures is no more enough to evaluate the organization’s performance;
- The rise of the role of intangible assets at the expense of tangible assets;
- The difficulty most organizations face in executing strategy,

1- The limitations of financial measures:

Prior to the 1980s, financial measures were the main focus of managers when evaluating their organizations' performance (Drury, 2012, p: 584). The main criticisms of the reliance only on financial measures are (Niven, 2005, Niven, 2006):

- The financial measures represent the past; the use of financial indicators such as return on investment ROI, operating income or share price does not reflect the future performance of the organization. Niven suggests that "a history of strong financial results is not indicative of future performance" (Niven, 2006, p: 06).

- Financial metrics are inadequate to meet the demands imposed by the mechanisms of creating the real value in the modern business economy “intangible assets”, because they focus only on the tangible assets with no measurement of employee innovation and customer relationships.
- Financial measures and reports like budgets, balance sheets or the income statement reflect the vertical hierarchic view of the organization, with no indication of the horizontal process view. This reporting system does not serve cross-functional work.
- Financial measures are by nature short term measures; focusing on short-term financial figures may undermine the managers' judgment as to what will really distinguish their organization from competitors in the long term.
- Financial measures are not relevant to many decisions in the organization, because those measures do not mirror the cause and effect relationship. For example, what decision do managers have to make when they know that sales have decreased by 10%? This financial indicator alone does not show the true reason for this drop.

2- The rise of intangible assets role

To understand the importance of intangible assets, Kaplan and Norton argue that the organization should ask some questions such as (Kaplan & Norton, 2004, p: 21):

- What is the importance of the culture that helps employees to understand and believe in their organization’s mission, vision, and core values?
- What would be the result if the organization invested in a knowledge management system or in a new customer database?
- Is it more important to improve the skills of all employees or focus on those in just a few key positions?

The skills of employees, information technology systems and organizational culture are some of the intangible assets in the organization, which have a great value in any organization, even more than the value of tangible assets in some organizations. This is not strange for organizations that operate in a competitive, complex and changing environment dominated by knowledge and information. As it is shown in Figure 2.1, the value of intangible assets has increased significantly over the last three decades. According to Kaplan and Norton, “if managers could find a way to estimate the value of their intangible assets, they could measure and manage their company’s competitive position much more easily and accurately” (Kaplan & Norton, 2004, p: 021).

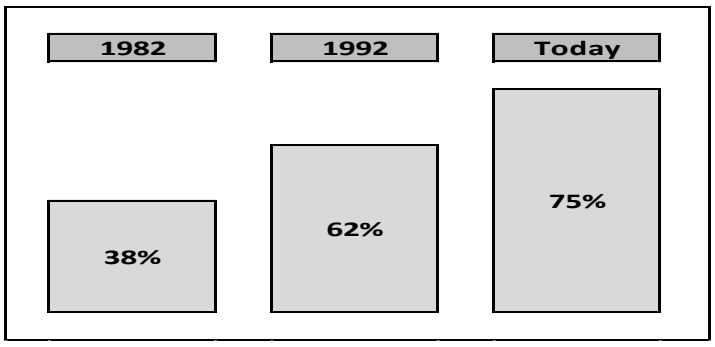

Figure 2. 2 : Increasing Value of Intangible Assets in Organizations (Niven, 2006, p: 08)

In the past, tangible (physical) assets were the focus-point of managers attention; they considered this type of asset as the only creator of value in the organization. Intangible assets differ in many ways from tangible assets; some of these differences are:

- Linking tangible assets to financial results is easier than the intangible assets case, because this latter works indirectly through complex chains of cause and effect. For example, training marketing employees should improve their communication skills with customers, which can increase satisfaction and loyalty of those customers, but we cannot trace easily the effect of this action on sales growth or margins (Kaplan & Norton, 2004, p: 22).
- Tangible assets are accurately quantified on the organization's financial statements, assets like buildings or machines are presented in the balance sheet with exact amounts. But on the other hand, we cannot find any information in numbers about an innovative culture that consistently delivers new products faster than its competitors, or about customer relationships (Niven, 2005, p:08).
- Tangible assets can be duplicated, the competitor can buy a machine does the organization already have. But on the other hand, intangible assets that are in possession of the organization cannot be bought or duplicated easily (Niven, 2006, p: 07).
- The value of tangible assets depreciates over time, but intangible assets value will appreciate with good use. Assets like organizational knowledge, for

instance, will rise every time employees communicate their knowledge (Niven, 2005, p: 08).

Although the importance of the intangible assets for the organization, it is difficult to measure and control such type of assets, an organization that uses only financial measures cannot get a whole image of its performance, traditional financial measures like sales growth do not reflect customer relationships. But even though, according to Kaplan and Norton, this rinsing importance of intangible assets point the way to a new approach for quantifying how intangible assets add value to the organization, because when the organization understand the difficulties related to valuing intangible assets, it learns that the measurement of the value they create is included in the strategic context it is pursuing (Kaplan & Norton, 2004, p: 22). The strategy of the organization determines the framework by which intangible assets can create. The measurement of such assets is based on the assessment process associated with the extent to which these assets are aligned to the organization's strategy.

The Balanced Scorecard provides a new framework of performance measurement and strategic alignment that can help organizations seeking to link their intangible assets to corporate value. In this matter, Niven argues that BSC has risen significantly to this fundamental challenge of measurement (Niven, 2005, p: 08).

3- The difficulty of executing strategy

The objectives of the organization can't be achieved by the strategy formulation alone; managers need to translate their strategy into an executive set of actions. Strategy execution is much important to the organization than its design; it is not easy for most organizations to transform long-term goals into day to day plans. Kaplan and Norton mentioned in their first book that in most cases of strategic failure, 70% of the problems were related to bad execution of the strategy (Kaplan & Norton, 2001, p:02).

Although the strategy has been an important subject in the field of management science, and despite the diversity of schools that have been exposed to this subject, but most of their interest was focused on the early stages of strategic management or how to design the strategy, while not enough efforts have been dedicated to the execution stage of the strategy.

According to Niven, there are four main reasons why strategy implementation remains elusive for most organizations: vision barrier, people barrier, management barrier and the resource barrier (Niven, 2005, p: 10)

- **The vision barrier:** Niven state that only 5% of the workforce understand strategy (Niven, 2005, p: 11). The Clarity and understandability of the organization's vision and strategy is vital for success, employees at all levels need to know and understand the long-term objectives of their organization in order to participate effectively in the achievement of those objectives and the organization success.
- **The people barrier:** in order to make the employees motivated, the organization's managers put incentive plans to compensate them. The problem with most of the incentive plans is that they always focus on short-term results, monetary awards are linked most of the time to short-term financial targets. And that according to Niven, may distort the strategic view of the organization, because people need to focus on the achievement of the long-term strategic objectives, not only short-term results.
- **The management barrier:** in most meetings in the organization, executive managers and the other members discuss financial results and analyze the budget problems. While according to Niven, strategic success requires that managers spend their time together to go farther than financial problems to a deeper understanding of value creation or destruction.
- **The resource barrier:** the problem with resources allocation is that budgets in most organizations are not linked to the strategy. In most cases, next year budgets are made by just looking at the previous financial reports and adding some numbers, with no linkage to the organization's strategic objectives.

The Balanced Scorecard has brought a new tool by which managers can translate their strategy into day to day actions and plans, Kaplan and Norton state that the balanced Scorecard through its four perspectives can link long-term strategic objectives to understandable financial and non-financial measures (Kaplan & Norton, 1996, p: 53). Employees in the organization that uses BSC effectively can understand what they have to do in order to participate in their organization's success because the measures in the Balanced Scorecard are derived from the strategy of their organization.

The Balanced Scorecard has an important role because it enables the organization to understand how the value is created. By merging financial and non-financial measures in a single tool, BSC shows the role of intangible assets and enhance their utilization. Another role of the BSC is that it facilitates strategy execution by translating strategic objectives into operational indicators.

D- The Balanced Scorecard evolution:

As has been said before, the initial use of the Balanced Scorecard was for business performance measurement by merging both financial and non-financial measures. But with years after adopting the Balanced Scorecard in plenty of organizations, it turned out that BSC can provide other features. Niven 2006 stated that his work with many organizations and research on best practices of BSC implementations has shown that the firm can benefit from three major roles of the BSC use: measurement system, communication tool, and strategic management system (Niven, 2006, p13).

1- The BSC first stage: a performance measurement system

The early writings of Kaplan and Norton on the Balanced Scorecard focused on the issue of performance measurement. Then, the Balanced Scorecard was defined as a tool for managing, measuring and evaluating business performance. The debate at that time was about finding a new framework in that matter to help managers to have a better understanding of their business performance metrics.

Kaplan and Norton presented the BSC at that time as a "four boxes" tool -as shown in Figure 2.1- that provided managers with a new framework to measure the overall performance. In addition to financial measures, managers were encouraged to consider measures derived from three other dimensions of business: customers, internal processes, learning and growth. Performance is measured within these four perspectives (Mooraj, Oyon, & Hostetter, 1999, p: 482)

The first article of Kaplan and Norton focused on the selection and reporting of a limited number of measures in each of the four perspectives. They suggested that the organization should take into consideration questions related to its vision and objectives to assist in the selection of measures to be used, then the employees have to change their behaviour to achieve those objectives (Kaplan & Norton, 1992, p: 79).

In this stage of the Balanced Scorecard, causal relationships between the four perspectives were showed, but Kaplan and Norton did not mention any specific use of them (Cobbold & Lawrie, 2002, p: 01). This stage of development was characterized by:

- The presentation of the overall picture of BSC;
- The focus on performance measurement only;
- A simple link between performance measures and the organization's vision and objectives;

2- The BSC second stage: a strategic management system

In this stage the role of BSC has evolved into a tool for designing and implementing the strategy of the organization at all levels of the four perspectives, the objective of BSC is no longer limited to set target levels of performance in those perspectives, but rather to formulate a strategy by linking all the perspectives. The new idea in this generation of the Balanced Scorecard is the cause and effect relationships between the perspectives among them and between those perspectives and the organization's vision and strategy as shown in Figure 2.3.

This causality is explained by Kaplan and Norton as a sequence of if-then statements. As an example, if the organization increases their employees training, then the knowledge they acquire about products may enhance the sales effectiveness and that will increase the margins (Kaplan & Norton, 1996, p: 65). The cause and effect relationships show how the organization can link the objectives and measures of the four perspectives among them.

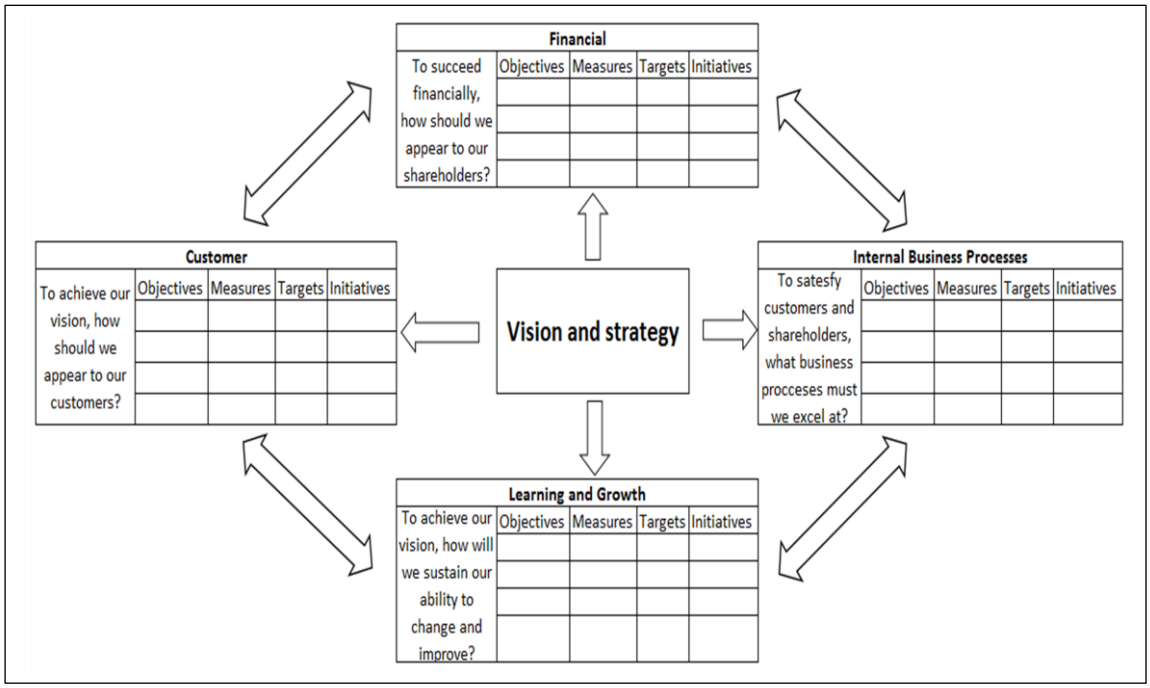

Figure 2. 3: BSC and the Translation of Vision and strategy.
(Kaplan & Norton, 1996b, p:78)

According to Niven, this generation of the Balanced Scorecard can alleviate the strategy execution barriers (Niven, 2006, p: 20-23). Organizations that use BSC effectively can make their strategy and vision clearer to the employees because BSC uses the language of indicators and measures to translate the vision. Using BSC strategic initiatives may help the organization to overcome the resource barrier because those

initiatives explain how to attain the targeted performance goals. Finally, BSC can create a new language of motivation for employees, by linking the incentives and rewards to the key performance drivers and directing the executive managers to focus on those drivers rather than looking only at the defects.

3- The BSC third stage: a communication tool

This generation has emerged to improve the features and mechanisms of the second generation design of the Balanced Scorecard in order to make it linked to the strategic aspects of performance. The main improvement in this generation of the Balanced Scorecard is the appraisal of the destination statement (Niven, 2014, p: 21). According to Cobbold and Lawrie, the destination statement describes in an optimal and detailed manner how the organization is expected to look like in the future. Cobbold and Lawrie also argue that in addition to the destination statement, there are three other key components of this generation of the Balanced Scorecard, which are: the strategic objectives, the strategic linkage model and the perspectives, measures, initiatives (Cobbold & Lawrie, 2002, p: 04-05).

The communicative role of the Balanced Scorecard is illustrated by the Strategy Maps.[1], because this latter show the objectives of the organization through the four perspectives and explain the links between those objectives on a cause and effect basis. Niven state that strategy maps can explain to the employees and all stakeholders in a simple and a powerful way the strategic choices of the Organization (Niven, 2014, p: 12).

E- The Balanced Scorecard components:

The balanced scorecard role is to balance between the historical accuracy of the financial numbers' safety and the leadership of future success. This framework requires that if the organization wants to implement its strategy correctly, it must translate it carefully into measures, objectives and initiatives within the four perspectives in a balanced manner. All these elements form a balanced scorecard, which consists of two main components. The first is the statement of the future direction through the vision and strategy, which describes the goal that the organization wants to reach. The second is the perspectives map that shows how to link the goals with the different perspectives of the organization.

[1] - The Strategy Map will be discussed in the third section of this chapter.

The Balanced Scorecard approach maintains financial measures to measure financial performance and completes them with leading measures for future financial performance. The Balanced Scorecard provides a framework for organizing strategic objectives in four perspectives, as shown in Figure 2.3.

The starting point of the Balanced Scorecard is the organization's vision and strategy, which going to be translated into performance measures, and those measures can be traced and used to measure the successful implementation of the organization's vision and strategy. This can be done by setting objectives and measures for each of the four perspectives (Niven, 2005, p: 13). Kaplan and Norton argue that there is a strategic dimension in the Balanced Scorecard, it translates the organization's vision and strategy into goals and benchmarks across a balanced set of perspectives (Kaplan & Norton, 1996b, p: 29).

Since the balanced Scorecard is a system for measuring performance, a strategic management system and a communication tool, it consists of a set of parts or elements interlocking to achieve a common goal. These elements can be classified into eight basic components as follows:

1. **Vision**: The vision shows where the organization is headed and what is the future image will be on it.
2. **Strategy**: consists of the sum of actions important to achieve the objectives set by the organization.
3. **The perspectives**: represent the pillars on which the balanced Scorecard is based, which drives the adoption and implementation of a specific strategy. These are four main perspectives: financial, customer, internal processes, learning and growth (Kaplan & Norton, 2001b, p: 90):
    - **Financial perspective:** To succeed financially, how should we look to our shareholders? That includes the strategy of growth, profitability and risk seen from the point of view of shareholders. The Balanced Scorecard retained the financial aspect, as the ultimate goal of the organization is to work for the profit of shareholders, which includes a set of financial indicators to measure the performance of the organization, which allows knowing how the strategy contributes to improving the organization's profits.
    - **Customer perspective:** To achieve the organization's vision, how should our customers see us? What are they waiting for? Which includes the strategy of creating value and differentiation from the point of view of customers, and

includes a set of measures that allow to identify the selected market sector, and helps to develop a market strategy that contributes to improving financial performance.

- **Internal processes perspective:** To achieve the vision of our shareholders and customers, what processes should we excel in? Which includes strategic priorities for the various operations that bring customers and shareholders satisfaction and incorporates the core processes in the organization that allows the presentation of an offer that brings attention to customers brings the customers and contributes to the creation of their loyalty.
- **Learning and Growth perspective**: To achieve our vision, how can we maintain the ability to change and improve? This includes the priorities of creating a climate that supports organizational change, innovation and growth, this perspective focuses on intangible assets of the organization.

4. **The Objectives**: The objective shows how to implement the adopted strategy. It is expressed at a measurable level to achieve the strategy; It represents the results to be achieved. The objectives are generally distributed across the four perspectives and have the same strategic importance. They must be specific, measurable, achievable, reasonable and time-bound.
5. **The Measures**: A indicator that measures the state of the objective to be achieved, which reflects the measure of progress towards objectives. These measures support the achievement of objectives, and serve as the sensor that determines the state of the target to be achieved by comparing it to a predetermined value.
6. **The Targets**: a target represents a quantitative value at a given point in time needed to achieve the objectives (person, 2009, p: 64), to be compared with the resulting value of the measurement in order to determine the variance (negative or positive) from that target.
7. **The Strategic Initiatives**: reflect the programs and temporary projects required to achieve the objectives set, a strategic initiative guides strategic performance and facilitates the process of implementing the strategy and achieving the objectives.
8. **Cause and Effect Relationships**: The linkage between the perspectives of a balanced scorecard is based on the relationship of cause and effect. The scorecard perspectives are not just a compilation of a set; it translates the strategy of the organization into a practical plan and links the results and the performance drivers to these results. It also expresses the relationships between an objective and another.

Balanced Scorecard helps the organization's management to describe the strategy, set the objectives, translate these objectives into clear and specific measures, compare them with target values, and identify the initiatives needed to achieve those objectives that help implement the strategy and the vision successfully.

The Balanced Scorecard is a practical performance measurement framework aimed at achieving three main objectives: 1) to measure the organization's performance by balancing both financial and non-financial measures, through four main perspectives. 2) to translate the strategy into specific objectives for the various departments and units of the organization, and 3) to deliver the strategy of the organization to all employees. By aligning long-term strategic objectives with short-term measures and indicators. This Scorecard creates a collective agreement on the organization's vision and strategy as well as translating it into a set of measurable objectives and communicating them to all members of the organization and linking them with their objectives and daily actions.

Section Two: The Balanced Scorecard Perspectives

The Balanced Scorecard was created with four main perspectives (financial, customers, internal processes, learning and growth), the Balanced Scorecard is concerned with three stakeholders: shareholders, customers and employees, the organization's performance must be seen through the perspective of them, and the organization's strategy should be designed and implemented in the light of the objectives in each perspective. In addition to those four perspectives, many researchers have tried to develop a scorecard with more perspectives, such as the environmental perspective (See e.g: Yu-Lung & Chun-Chu, 2010; Figge, et al, 2002) or Risk management perspective (See e.g: Beasley, et al, 2006). In this section, we will address the original four perspectives by discussing the importance of those perspectives, and stating the measures used in each one.

A- The Financial Perspective

Although all the criticisms of the financial performance measures, they are still playing an important role in most organizations. It is true that the financial measures are not enough for good performance measurement, but no organization can abandon them completely. The idea of the Balanced Scorecard is to add other aspects of the organization's performance to the financial aspect. The financial perspective of the Balanced Scorecard describes the results from a traditional financial point of view. It is considered one of the pillars of performance measurement. Its results represent measures aimed at achieving the organization's financial objectives.

I. The Financial Objectives and The Business Life Cycle:

According to Kaplan and Norton, financial objectives might vary significantly from one stage of a business's life cycle to another, in this matter, they identified three stages of the business: the growth stage, the sustain stage and the harvest stage (Kaplan & Norton, 1996b, p: 48).

- **The Growth Stage:** in this stage, the organization allocates the most financial resources to infrastructure development (facilities, systems, distribution networks,…). The cash flows in this stage might be negative, and the return on investment can show a low level. So, the financial objective for the growth stage will be growth rates in revenues, and sales growth rates in targeted markets, customer groups, and regions (Kaplan & Norton, 1996b, p: 48).

- **The Sustain Stage:** the organization in this stage still give importance to investment and reinvestment efforts, but the focus point is how to do it with excellent returns on invested capital, maintain and grow the market share. The financial objective in the sustain stage is linked with the business profitability, the organization should seek good results: operating income, gross margin and accounting income.
- **The Harvest Stage:** which is the mature stage, the organization seek to harvest the investments efforts made in the two earlier stages. The key objective in this stage is to maximize operating cash flows, and reduce the working capital requirements (Kaplan & Norton, 1996b, p: 50).

II. The Themes for The Financial Perspective:

According to Kaplan and Norton, there are three main financial themes in each of the stages mentioned above, these themes are: revenue growth, cost reduction and asset utilization, Figure 2.4 shows some examples of the financial measures in each theme and each business life cycle.

		Strategic Themes		
		Revenue Growth	**Cost Reduction**	**Asset Utilization**
The Business Life Cycle	**Growth**	Sales growth rate by segment Percentage revenue from new product, services, and customers	Revenue/Employee	Investment (percentage of sales) R&D (percentage of sales)
	Sustain	Share of targeted customers and accounts Cross-selling Percentage revenues from new applications Customer and product line profitability	Cost versus competitors' Cost reduction rates Indirect expenses (percentage of sales)	Working capital ratios (cash to-cash cycle) ROCE by key asset categories Asset utilization rates
	Harvest	Customer and product line profitability Percentage unprofitable customers	Unit costs (per unit of output, per transaction)	Payback Throughput

Figure 2. 4 : The Measurement of Financial Themes

(Kaplan & Norton, 1996b, p: 52)

- **Revenue Growth and Mix :**

In accordance with this financial strategy, the organization seeks to maximize its revenues in several ways. This can be achieved through the introduction of a new product, new applications, new customers and a new market, new relationships, a new pricing strategy:

- **Raising revenue by introducing a new product or service:** The Organization often introduces new products or services during the business growth stage, by expanding existing lines of production. The organization can measure this objective by using the ratio of revenue from new products and services introduced in a given period.
- **Raising revenue by creating new applications:** The development of a whole new product can be very costly and time-consuming for the organization. The organization

can find it easy to grow revenues by developing new applications for the existing products. In the pharmaceutical industry, for example, it is possible to expand the use of the same drug, with some modifications only. With these new advantages, revenues from this product or service will grow, whether through increases in price, sales or both. If new product applications is an objective, the ratio of sales in new applications would be a useful BSC measure (Kaplan & Norton, 1996b, p: 53).

- **Raising revenue by acquiring new customers and markets:** raising revenues can be achieved through the introduction of the existing product and service into a new marketing space through which the organization will increase its revenues by acquiring new market shares and new customers. In this case, measures like the ratio of revenues from new customers, market segments, and geographic regions would underline the importance of exploring this source of revenue improvement (Kaplan & Norton, 1996b, p: 53).
- **Raising revenue through new relationships between units and departments:** Some organizations seek to increase their revenues by creating an interaction between different strategic business units that drives the process of development and achievement of joint projects, whether for building or delivering value. The objective of the organization is to share technology between departments and business units and increase sales to the customers through cooperation among all those units. The objective can be measured by the amount of revenue generated from cooperative relationships across multiple business units (Kaplan & Norton, 1996b, p: 54).
- **Raising revenue through a new pricing strategy:** Organizations often follow this type of strategy when they find that revenues do not adequately cover costs; this situation is easy to determine when organizations apply an activity-based cost system (ABC) that accurately calculates costs and profitability, of the products, services or customers. By using ABC system, some organizations have discovered some gaps in production processes and costs related to the handling of customers' requests, where they had to raise prices or reduce the quality and volume of the services associated with the product (Kaplan & Norton, 1996b, p: 55).

- **Cost reduction or Productivity improvement**

Reducing costs and enhancing productivity is another vital financial mechanism (Niven, 2006, p: 147). Kaplan and Norton propose some ways in which the organization can reduce its costs and improve the productivity, those ways are: increasing revenue

productivity, reducing unit costs, improving channel mix and reducing operating expenses (Kaplan & Norton, 1996b, p: 55):

- **Increasing Revenue Productivity:** in the growth stage, the organization is giving little importance to cost reduction, because the efforts to reduce costs via automation and standardized processes may conflict with the flexibility needed to customize new products and services for new markets. Therefore, in this stage, the organization may focus on revenue enhancement objectives; in this case, measures like revenue per employee or revenue per machine may encourage shifts to higher value-added products and services and to improve the competencies of the organization's physical and personnel resources (Kaplan & Norton, 1996b, p: 55).
- **Reducing Unit Costs:** in the sustain business stage, the organization seeks to raise its profitability and return-on-investment ratios by reaching competitive cost levels, improving operating margins, and monitoring indirect and support costs, the objective here is to reduce the unit cost of the operation's output (Kaplan & Norton, 1996b, p: 56). In this matter, Activity-based Cost Management system ABCM is likely required because through this system, many cost reduction opportunities such as activity analysis, cost driver analysis and value-added versus non-value-added analysis.[1]
- **Improving Channel Mix:** for most organizations, transactions with customers can be done via multiple channels; for example, customers and suppliers can perform their purchasing by the traditional way or by using online purchasing. Therefore, the organization can reduce costs by shifting customers and suppliers from high-cost manually processed channels to low-cost electronic channels (Kaplan & Norton, 1996b, p: 56).
- **Reducing Operating Expenses:** This type of expense often represent a high percentage of total costs because it cannot be controlled easily. Organizations strive to reduce as much as possible these costs by adopting measures such as the ratio of these expenses to total costs, to total revenues or to the amount of sales (Kaplan & Norton, 1996b, p: 57). In order to reduce this type of cost, the organization must first understand their source; the use of Activity-based Cost Management ABCM system can show real insights of the operating expenses sources, by linking these expenses with the activities and processes performed, only there the cost reduction efforts will be meaningful.

[1] - See chapter one, section three.

- **Asset Utilization of Investment Strategy:**

The organization can also improve its revenues by improving the utilization of its assets, this can be achieved through optimization of the working capital. For example, the organization can use techniques allowing it to support greater sales at lower levels of inventory (Niven, 2014, p: 174).

According to Kaplan and Norton, the organization can measure its efficiency of working capital management by the cash-to-cash cycle, it represents the time that the organization requires to convert cash payments to suppliers of inputs to cash receipts from customers. Some organizations work with negative cash-to-cash cycles; they cannot pay suppliers until they receive cash from customers (Kaplan & Norton, 1996b, p: 58). In this matter, the organization should minimize the cash-to-cash cycle time it has to match inventories closely to final sales, accelerate the collecting from customers, and negotiate favourable terms with suppliers. This can be an excellent way to improve working capital efficiency.

The organization can also use other measures of asset utilization, it may attempt to improve capital investment procedures, by either enhancing the productivity from capital investment projects or accelerating the capital investment process in order to get the cash returns from these investments earlier; this means the minimization of the cash-to-cash cycle for investments in physical and intellectual capital (Kaplan & Norton, 1996b, p: 59).

All the measures mentioned before can be extracted from the accounting system, furthermore, Niven states some measures for the financial perspective in the Balanced Scorecard, are obtained from outside the organization such as: share price and market valuation (Niven, 2006, p: 147).

Through these three themes, the organization can have a comprehensive overview of its financial performance. The selection of the performance measures for each theme should be compatible with the business life cycle stage.

III. The Typical Measures of the Financial perspective:

The Financial perspective measures can help the organization in the process of determining measures for the rest of BSC perspectives, that's why this process must be given great importance; Financial performance measures must translate the objectives appearing on Organization's Strategy Map accurately (Niven, 2006, p: 147). As shown

in Figure 2.5, there are many typical measures from the Financial perspective. However, the organization should select a set of measures that really reflect its objectives.

According to Hoque et al., the choice of the measures is affected by the market competition and the application of computer-aided manufacturing processes. In their study, they have found that both the intensity of competition and the application of computer-aided manufacturing processes have a positive impact on the choice of multiple measures of performance (Hoque, Mia, & ALam, 2001). Hoque et al. suggest the use of three measures from the Financial perspective: Return on investment, Operating income, and Sales growth.

· **Total assets**	· **Value-added per employee**
· **Total assets/employee**	· Compound growth rate
· **Profits as a % of total assets**	· Dividends
· **Return on net assets**	· Market value
· **Return on total assets**	· Share price
· **Revenues/total assets**	· Shareholder mix
· **Gross margin**	· Shareholder loyalty
· **Net income**	· Cash flow
· **Profit as a % of sales**	· Total costs
· **Profit per employee**	· Credit rating
· **Revenue**	· Debt
· **Revenue from new products**	· Debt to equity
· **Revenue per employee**	· Times interest earned
· **Return on equity (ROE)**	· Day sales in receivables
· **Return on capital employed (ROCE)**	· Accounts receivable turnover
· **Return on investment (ROI)**	· Days in payables
· **Economic value added (EVA)**	· Days in inventory
· **Market value added (MVA)**	· Inventory turnover ratio

Figure 2. 5 : Commonly Used Financial Measures

(Niven, 2006, p: 148)

B- The Customer perspective

Most organizations currently rely on the needs and desires of their customers when designing their strategies, because of their great importance for the organization's success and survival in a competitive market, which depends on the ability to provide customers with products or services with high quality and competitive prices. Professor Peter Drucker state in this matter that "... the single most important thing to remember about any enterprise is that results exist only on the outside. The result of a business is a satisfied customer ... Inside an enterprise, there are only costs" (Drucker, 2001, p: 15). Organizations' managers must concentrate on their customers' satisfaction as a success key, and not only on the internal capabilities or technological innovation. Otherwise, they will lose customers for competitors whose products or services better align with their preferences. This importance requires that the customer satisfaction must be measured effectively.

According to Kaplan and Norton, the measures used in this perspective allow the organization to better understand how their customers see them (Kaplan & Norton, 1992, p: 79). But before measuring, the organization must first identify who its targeted customers are, and then it compares what it offers to their satisfaction and what they are expecting (Niven, 2006, p: 14).

Kaplan and Norton explain more in this matter, they state that before fixing objectives to the customer perspective, the organization should perform market segmentation, Because the strategy may differ from one customers segment to another segment. And as the Balanced Scorecard is a translation of the organization's strategy, it should identify the customer objectives in each targeted customers segment (Kaplan & Norton, 1996b, p: 64).

I. The measures for the customer perspective:

The measures for the customer perspective are: market share, customer acquisition, customer retention, customer satisfaction, and customer profitability. As shown in Figure 2.4, these measures are linked to each other with causal relationships.

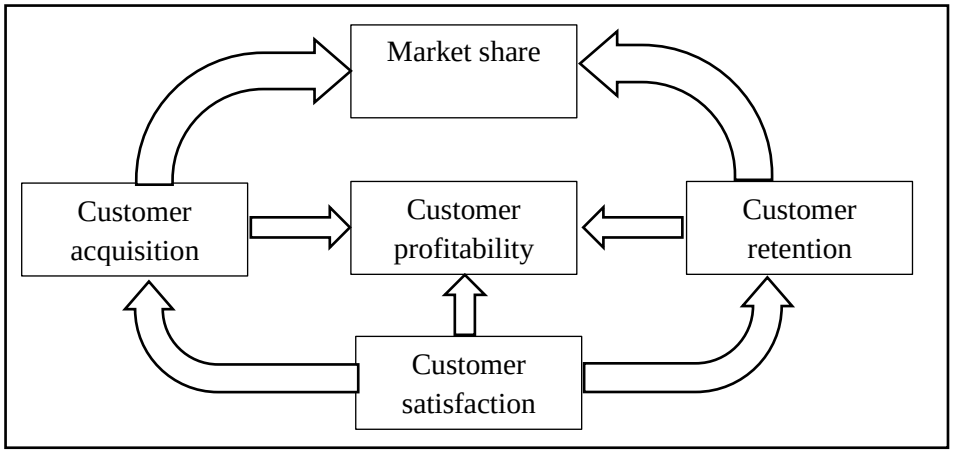

Figure 2. 6: The Customer Perspective-Core Measures

Adapted from (Kaplan & Norton, 1996b, p: 68)

- **The market share:** The market share tells how well an organization is penetrating the desired market, it reflects the ratio of the business to the whole market. The market share can be measured by the sales amount achieved by the organization in a given market, the number of customers, or the unit volume sold. This measure can indicate whether the intended strategy gives expected results (Kaplan & Norton, 1996a, p:59).
- **Customer retention:** as a means to maintain and increase the market share, the organization must focus in the first place on the retention of the existing customers. The measure of customer retention indicates the degree of the customers' loyalty to the Organization (Kaplan & Norton, 1996b, p: 69). In this matter, several measures can be adopted to measure the customer retention, such as: Customer turnover, the number of transactions with each customer,…
- **Customer acquisition:** in order to increase the market share, the organization have to look always for new customers by making marketing efforts such as marketing research, advertising, … . The customer acquisition can be measured by either the number of new customers or the total sales to new customers (Kaplan & Norton, 1996b, p: 70). In addition, the organization must take into consideration the cost of acquiring a new customer when measuring customer acquisition, it could use the ratio of cost of a new customer solicitation to the revenue generated from that customer.

- **Customer satisfaction:** as shown in Figure 2.4, both customer retention or acquisition are derived from customer satisfaction; customer satisfaction measures offers feedback on how well the organization is doing (Kaplan & Norton, 1996a, p:60). The organization should perform surveys on their customer satisfaction periodically, in order to obtain valid responses and feedback about the products or services they have purchased (Kaplan & Norton, 1996b, p: 70). Customer satisfaction could be measured by the number of surveys performed, the response rate on surveys.
- **Customer profitability:** The desire of expanding the market share by acquiring new customers or retaining those existing ones is important but not enough, the organization may have a good customer base, however a small percentage of them might participate in the organization's profitability. The organization want more than satisfied customers; it wants profitable ones (Kaplan & Norton, 1996a, p:61). The customer profitability measures may show some customers unprofitable, here and before taking any action, Kaplan and Norton suggest that the Organization look first in which market segment those customers are. If they in a targeted segment, the organization should look for ways to transform them into profitable customers, either by reviewing the pricing policy or by improving the production and distribution in order to reduce customer costs (Kaplan & Norton, 1996b, p: 70).

According to Niven, although these measures are valuable and easy to generate, they measure actions that are already taken, they represent lagging performance measures. The key to this is to know the leading indicators of a weak outcome of one of the previous measures. Niven state that the Balanced Scorecard customer perspective must mix both lag and lead indicators (Niven, 2006, p: 153). As an answer to this issue, Kaplan, Norton and Niven propose a model to determine the leading indicators by relying on the value proposition.

II. Using value proposition to determine leading indicators:

According to Niven, the value proposition is what an organization is offering to customers through its products or services. He argue that the organization has the choice between three disciplines in order to develop the customer value proposition, those disciplines are: operational excellence, product leadership and customer intimacy (Niven, 2006, p: 147). The value proposition is what leads the customer, satisfaction, and loyalty, it represents the driver for the measures mentioned earlier.

Kaplan and Norton explain the value proposition in the same manner but with other attributes, they argue that it can vary from one industry to another, and from a market segment to another within the same industry. They define the value proposition through three main attributes: the product/service Attributes, the customer relationship and the image and reputation as shown in Figure 2.7(Kaplan & Norton, 1996a, p: 61):

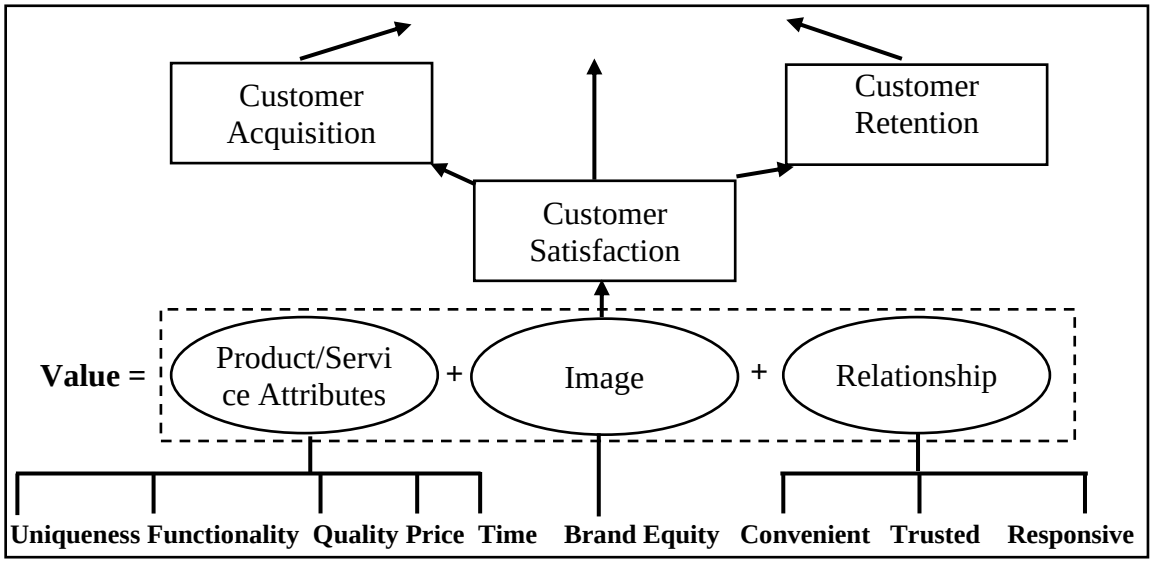

Figure 2. 7: The Customer Value Proposition.

(Kaplan & Norton, 1996a, p: 62)

- **The product/service Attributes:** in some industries, the customer gives more importance to the features of the product or service, his satisfaction may be linked with many characteristics of the product such as: the price, the lead time, the quality, the functionality and the uniqueness.
- **The customer relationship:** Customer relationships are among the most important components of the value that an organization can provide to its customers. Kaplan and Norton state that the customer relationship encompasses two dimensions, the delivery of the product or service (response, delivery time), and the impression of the customer after his purchasing from the Organization (Kaplan & Norton, 1996b, p: 74).
- **The image and reputation:** This dimension enables the organization to define and identify itself to customers. It reflects the intangible factors that attract a customer to the Organization (Kaplan & Norton, 1996b, p: 75). Working on the image is not easy, the organization may take years to build an image in the consumers' minds,

but if it succeeds in that, the image becomes the major component of the value of the organization.

The value proposition model enables the organization to understand the leading performance measures of the customer perspective, it provides a framework for understanding and analyzing sources of customer satisfaction.

III. The Typical Measures of the Customer Perspective:

There are many measures and indicators for measuring the performance of the customer perspective, Figure 2.8 show a sample of these measures. Although the importance of those measures, the organization cannot use them all at once. It must choose what is essential for customer satisfaction and profitability in the light of its strategic objectives and the environment.

· **Customer satisfaction**	· **Win rate (sales closed, sales contacts)**
· **Customer loyalty**	· Customer visits to the company
· **Market share**	· Hours spent with customers
· **Customer complaints**	· Marketing cost as a percentage of sales
· **Complaints resolved on first contact**	· Number of ads placed
· **Return rates**	· Number of proposals made
· **Response time per customer request**	· Brand recognition
· **Direct price**	· Response rate
· **Price relative to competition**	· Number of trade shows attended
· **Total cost to customer**	· Sales volume
· **Average duration of customer relationship**	· Share of target customer spending
· **Customers lost**	· Sales per channel
· **Customer retention**	· Average customer size
· **Customer acquisition rates**	· Customers per employee
· **Per cent of revenue from new customers**	· Customer service expense per customer
· **Number of customers**	· Customer profitability
· **Annual sales per customer**	· Frequency (number of sales transactions)

Figure 2. 8: Typical Measures of the Customer Perspective

(Niven, 2006, p: 154)

Hoque et al. suggest the use of eight measures for the customer perspective: Customer response time, Survey of customer satisfaction, Number of customer

complaints, On-time delivery, the cycle time from order to delivery, Percent shipments returned due to poor quality, Warranty repair cost and the Market share (Hoque, Mia, & ALam, 2001).

C- The Internal processes perspective

The process view of the organization is of great importance for the strategic management process. Smith argue that the processes improve the level of teams inside the organization and develop new innovation operations to improve the organization performance, all these aspects are integrated to give an effective link between innovation and strategy through the processes managers focus on and attempt continuously to develop and improve (Smith, 2007, p: 23-24).

The Internal Processes perspective is the interpreter of the organization's objectives across the rest of the Balanced Scorecard perspectives. This focus on the internal processes highlights the area where the organization must excel in order to achieve its strategic objectives. The Internal Processes objectives and measures should be developed after formulating objectives and measures for the financial and customer perspectives. This can allow organizations to focus on the processes that will contribute to the achievement of the objectives developed for customers and shareholders (Kaplan & Norton, 1996b, p: 92).

I. The Internal Processes Value Chain:

One of the most powerful tools to understand the Internal Processes of an organization is the Value Chain. According to Porter, the organization "is a collection of activities and processes that are performed to design, produce, market, deliver, and support its product." (Porter, 1998, p: 36), he called all these activities the Value Chain. Porter's Value Chain is composed of two types of activities: primary activities and support activities. Primary activities are oriented to the physical creation and delivery of the product to the customer, while support activities exist in order to support the primary activities, such as human resources management and the technology development (Porter, 1998, p: 38).

For the Balanced Scorecard use, Kaplan and Norton propose a simple generic model for the Value Chain, their model consists of three generic phases as shown in Figure 2.9: the innovation process, the operations process and the postsale service process (Kaplan & Norton, 1996b, p: 96). According to them, the organization must set objectives and measures for each phase of its Value Chain. Niven on the other hand, add the regulatory and social process, as an important component of the internal performance (Niven, 2006, p: 155).

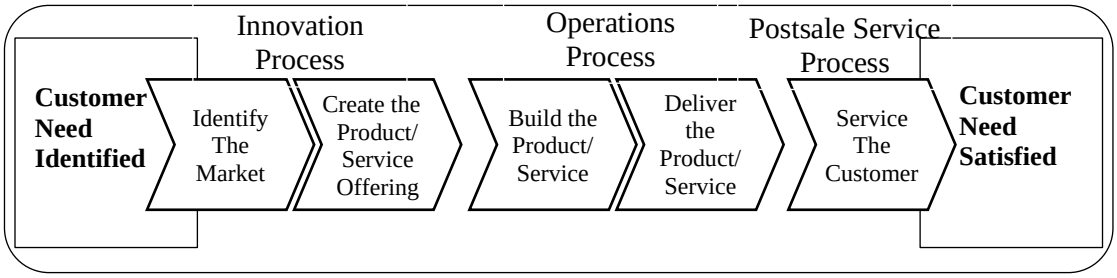

Figure 2. 9 : Kaplan and Norton Generic Value-Chain Model

(Kaplan & Norton, 1996b, p: 96)

1. The Innovation Process:

The innovation process is of great importance for all organizations, many of them treat it as even more important than the operations process. In manufacturing organizations, most of the product costs have been committed during the conception and design stage; Therefore, opportunities for cost reduction may be limited. One of the effective cost management ways is to give more effort to the pre-Manufacturing phases.

As shown in Figure 2.9, the innovation process is composed of two main sub-processes, the first one is the identification of the market and customers needs by conducting market researches, through which the organization can know the preferences of the potential and existing customers, and the level of prices that they can accept. After obtaining the market researches results, the organization moves to the second step which is product design and development. Kaplan and Norton suggest that during step, the focus must be on (Kaplan & Norton, 1996b, p: 99):

- Performing basic research to develop totally new products and services for delivering value to customers,
- Performing applied research to exploit existing technology for the next generation of products and services, and
- Making focused development efforts to bring new products and services to market.

While measuring performance of the Internal Processes Perspective, the organization mustn't ignore this process, it has to set objectives and measures for each step of the innovation process. For this purpose, Kaplan and Norton give some examples of measures used by a leading industrial company operating in a competitive market with rapid technological change, this company use (Kaplan & Norton, 1996b, p: 101):

- Percentage of sales from new products,
- Percentage of sales from proprietary products,
- New product introduction versus competitors,
- Manufacturing process capabilities, and
- Time to develop next generation of products.

According to Niven, there are also other possible measures for the innovation process, such as (Niven, 2006, p: 155):

- The amounts of money and the working hours spent on research,
- The number of new products or services introduced,
- The number of new products or services introduced,
- The new product or service cycle time (length of time from conception to introduction),
- The revenue from new products or services, and
- The new product sales by channel.

2. The Operations Process:

The operations process starts when receiving a customer order and finishes with delivery of the product or service to the customer. This process highlights how the current products are delivered efficiently, consistently and timely to the existing customers. In the traditional performance measurement systems, the operations process have been measured by using financial indicators like budgets, standard costs, and variances. The limited use of the financial measures has led to dysfunctional decisions, because while trying to improve the efficiency of labor and machines, and purchase price variances, the organization focus might be toward keeping labor and machines operating, even to generate inventory not needed by the customer, or on selecting the cheapest supplier in order to reduce purchasing costs with no regard to the quality and the terms of delivery (Kaplan & Norton, 1996b, p: 104).

The main measures for the operations process are: time, quality and costs. For the time measure, the most manufacturing organizations use the ratio of manufacturing cycle effectiveness (MCE), which is defined as:

$$\text{MCE} = \frac{\text{Processing Time}}{\text{Throughput Time}}$$

The ultimate objective of most organizations is to make the ratio equal or close to one 1; since the throughput time consists of processing time, inspection time, mouvement time and waiting time, an MCE close to one means that the organization has minimized the efforts and resources allocated to those activities (inspection, mouvement and waiting) that are non-value-added activities (Kaplan & Norton, 1996b, p: 117). For the operations process quality measurement, most organizations use a set of measures such as: process defect rates, good output to total output, waste, rework, returns (Kaplan & Norton, 1996b, p: 119).

For the operations process cost measurement, the use of Activity-based Costing and Management system ABC/M can offer a good framework; because through this system (unlike the traditional cost systems), the organization can trace costs to the activities and processes performed, which provide a better cost structure understanding, and better cost management opportunities.

3. The Post-sale Service Process:

This process comprises warranty and repair activities which are done after the sale to customers. The organization can use this process to improve its value proposition, by offering quick and reliable service to the customers. The importance of this process appears when trying to build good relationships with customers.

In the Balanced Scorecard approach, the organization can measure the postsale service process by using the same metrics stated above: time, quality and costs. For example, the postsale service process cycle time (from customer request to final resolution of the problem) can be used to measure the response speed. Quality of service can be measured, for example, by the number of calls required to solve the problem and the number of complaints received after solving the problem. The cost measures can evaluate the efficiency of the service (Kaplan & Norton, 1996b, p: 106).

II. The Typical Measures of the Internal Processes Perspective:

Internal processes play an important role in enhancing the organization's ability to achieve its objectives; it is the central link to achieve customer satisfaction and financial goals. The process of developing indicators and measures for the internal processes perspective requires careful knowledge about the current status of activities and operations in the organization, methods of achievement and, as well as anticipating these operations in the future. It is necessary to select the most critical indicators because too many indicators make performance measurement more unfocused. Figure 2.10 shows some typical measures that can be used to measure the internal processes performance.

· **Average cost per transaction**	· **Breakeven time**
· **On-time delivery**	· Cycle time improvement
· **Average lead time**	· Continuous improvement
· **Inventory turnover**	· Warranty claims
· **Environmental emissions**	· Lead user identification
· **Research and development expense**	· Products and services in the pipeline
· **Community involvement**	· Internal rate of return on new projects
· **Patents pending**	· Waste reduction
· **The average age of patients**	· Space utilization
· **The ratio of new products to total offerings**	· Frequency of returned purchases
· **Stock-outs**	· Downtime
· **Labor utilization rates**	· Planning accuracy
· **Response time to customer requests**	· Time to market of new products/services
· **Defect percentage**	
· **Rework**	· New products introduced
· **Customer database availability**	· Number of positive media stories

Figure 2. 10 : Typical Measures for the Internal Processes Perspective

(Niven, 2006, p: 156)

Hoque et al. suggest the use of six measures for the Internal Processes Perspective: the manufacturing lead time, the ratio of good output to total output, the labor efficiency variance, the material efficiency variance, the rate of material scrap rate, and the per cent defective products shipped (Hoque et al., 2001).

D- The Learning and Growth Perspective:

The perspective of learning and growth is one of the most important additions of the Balanced Scorecard. The importance of this perspective stems from the necessity of knowledge in organizations in the current environment. Objectives in the learning and growth perspective are the drivers for achieving excellent outcomes in the first three scorecard perspectives. The main idea for the Balanced Scorecard in general and in this perspective in particular is how to transform the power of the intangible assets into good financial results; many organizations fail to find the link between their employees knowledge and financial success. The learning and growth perspective provides measures and objectives for three main intangible assets, which are: human capital (employee capabilities), information capital (systems capabilities) and the organizational capital (motivation, empowerment and alignment).

I. The Human Capital:

Investing in human capital is one of the most important long-term investments for the organization; however, many organizations find it difficult to link their human capabilities with long-term success. For example, how to measure the effectiveness of an employees training program on operational income? The Balanced Scorecard through the learning and growth perspective can show that link by setting measures and objectives for the employees' capabilities.

To achieve objectives in the financial, the customer and the internal processes perspectives, the organization must direct its intangible assets, especially the human factor to serve the strategic objectives. Kaplan and Norton claim that if the organization is willing to increase or even to maintain its level of financial and customer performance, it has to focus the attention on the front-line employees, because they are the key factor to improve the internal processes and customer relationships (Kaplan & Norton, 1996b, p: 127). The indicators used for the customer and the internal processes might help the organization to measure and improve performance in these two perspectives, but those measures cannot be used to drive future performance. This fact according to Kaplan and Norton, force the organization to perform major refinement on the employees' skills to enhance their creative capabilities to achieve organizational objectives.

The objectives and measures for the employees capabilities are divided into three core measurements as shown in Figure 2.11: employee satisfaction, employee retention and employee productivity.

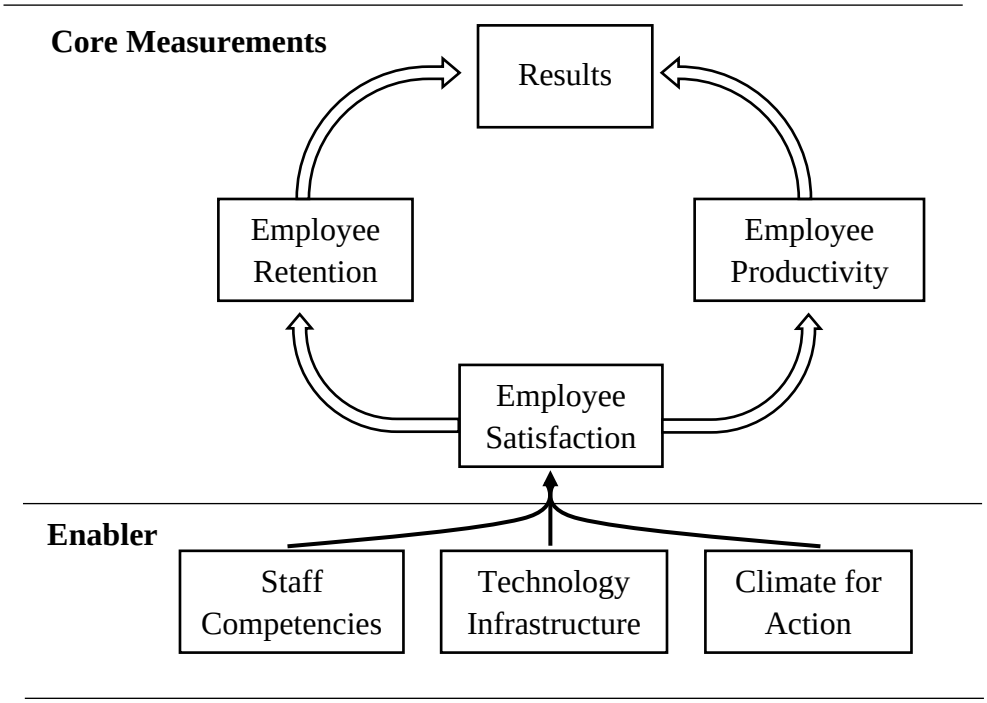

Figure 2. 11 : The Learning and Growth Measurement Framework

(Kaplan & Norton, 1996b, p: 129).

1. Employee satisfaction:

The employee satisfaction directly affects their productivity and retention and thus their results and performance. Studies have shown a great correlation between employee satisfaction and customer satisfaction. The satisfaction of employees leads to increased responsiveness, quality and service to customers (Kaplan & Norton, 1996b, p: 130). Employee satisfaction can be measured by conducting periodic surveys, the employees surveyed are asked to score their satisfaction. Kaplan and Norton suggest some elements for the employee satisfaction survey (Kaplan & Norton, 1996b, p: 130):

- Involvement with decisions
- Recognition for doing a good job
- Access to sufficient information to do the job well
- Active encouragement to be creative and use initiative
- Support level from staff functions
- Overall satisfaction with the company

2. Employee retention:

The organization must always seek to retain its employees, especially those who have accumulated knowledge and experience. Kaplan and Norton claim that long-term, loyal employees improve the organization's values, knowledge of organizational processes, and sensitivity to the needs of customers. The organization may use the percentage of key staff turnover to measure its employee retention (Kaplan & Norton, 1996b, p: 131).

3. Employee productivity

The productivity of the employees is a measure of the overall effect of improving employees competencies and satisfaction. The idea of measuring employees productivity is to link the output generated by them to their number; for example: units produced per employee or number of visits per sales employee. Kaplan and Norton argue that the organization may use revenue per employee to measure its employees' productivity, it is a simple and easy to use, however, it may have some limitations; the use of revenue without including costs of resources sacrificed to achieve that revenue might lead to a situation where revenues increase while profits decrease (Kaplan & Norton, 1996b, p: 131). The authors also claim that if the organization uses the revenue per employee to motivate its employees to achieve higher levels of productivity, it should use other economic success measures to balance the measurement, in order to avoid achieving targets in dysfunctional ways.

Niven also argues that the organization may use other aspects to measure the human capital performance such as: human capital readiness, recruitment and training (Niven, 2005, p: 75-76). The human capital has an important role in the learning and growth perspective; employees productivity, retention and satisfaction can provide huge opportunities for the organization to enhance its performance. However, the human capital alone is not sufficient to bring all the success, the organization has to create a system that enriches its employees with useful information.

II. The Information Capital:

Even a satisfied, loyal and productive employee cannot be effective in the current environment without information on customers, internal processes and the financial consequences of his or her decisions. Kaplan and Norton argue that in an organization, the front-line employees must have excellent information about their customers'

relationships, profitability and which market segment they occupy. Also, the operations employees need to get feedback on products they have just produced or services they have just delivered. This information can make those employees more capable of bringing more improvements to eliminate defects and reduce costs and time (Kaplan & Norton, 1996b, p: 134-136).

Niven state that information capital is based on the use of technology, today's organizations cannot perform and survive in their environment without giving importance to the technological aspect, Niven gives some typical information capital objectives (Niven, 2005, p: 77):

- Improve technology infrastructure
- Leverage technology
- Increase knowledge management and information sharing
- Gather, share, and use information effectively

III. The Organizational Capital

The organizational success cannot be achieved if the organization focus only on its employee skills and information capital, the employee needs to be motivated and allowed to make decisions in the best interest of the organization. The organizational capital is the third enabler for the learning and growth perspective (Kaplan & Norton, 1996b, p: 136).

The organizational capital is based on three pillars, the first of them is the employee motivation, for this matter, the organization must find indicators to measure its employee motivation. Kaplan and Norton suggest the use of the number of suggestions per employee; they argue that this measure can capture the ongoing participation of employees in improving the organization's performance (Kaplan & Norton, 1996b, p: 136). Niven, on the other hand, chose to talk about culture as the first pillar of the organizational capital, he argues that to measure culture, and satisfaction in general, most companies will turn to employee surveys (Niven, 2005, p: 79).

The second pillar of organizational capital is the employees' empowerment, because the motivation of an employee is not enough. So the organization must seek how to improve continually the quality, time and performance.

Finally, the organization must align its employee actions and objectives with the mission, values and strategy; This alignment is a huge necessity if the organization wants to exploit the advantages of intangible assets such as culture and knowledge.

If the organization really wants to achieve good results from an internal processes perspective, the customer perspective and ultimately the shareholders financial perspective, it should focus on the learning and growth perspective, which is the basis of the other three perspectives and the foundation on which the balanced Scorecard is built. The organization should set objectives and measures for this perspective, Niven propose several indicators that can be used as measures for the learning and growth perspective as shown in Figure 2.12.

· **Employee participation in professional or trade associations**	· **Internal communication rating**
· **Training investment per customer**	· Employee productivity
· **Average years of service**	· Number of Scorecards produced
· **Percentage of employees with advanced degrees**	· Health promotion
· **Number of cross-trained employees**	· Training hours
· **Absenteeism**	· Competency coverage ratio
· **Turnover rate**	· Personal goal achievement
· **Employee suggestions**	· Timely completion of performance appraisals
· **Employee satisfaction**	· Leadership development
· **Participation in stock ownership plans**	· Communication planning
· **Lost-time accidents**	· Reportable accidents
· **Value-added per employee**	· Percentage of employees with computers
· **Motivation index**	· Strategic information ratio
· **Outstanding number of applications for employment**	· Cross-functional assignments
· **Diversity rates**	· Knowledge management
· **Empowerment index (number of managers)**	· Ethics violations

Figure 2. 12 : Typical Measures for the Learning and Growth Perspective

(Niven, 2006, p: 162)

Section Three: The strategic use of the Balanced Scorecard

A- Mission, Values, Vision, and Strategy

The ultimate goals when creating an organization is to achieve profit, and continuous development. In order to achieve these goals, the organization must set its vision to achieve future plans. The focus of the organization must not be only on the financial results, but also it has to verify if it has achieved both its vision and its objectives, to achieve long-term success.

The mission is the idea of the existence of the organization, it is a fixed concept, while the vision of the organization is the long-term purpose of the organization, it is a variable and moving concept has not yet been achieved, while the strategy is the way to reach the future goals of the organization through short and medium-term objectives. As shown in Figure 2.13, the mission is an idea, the vision is a goal while the strategy is differentiating activities.

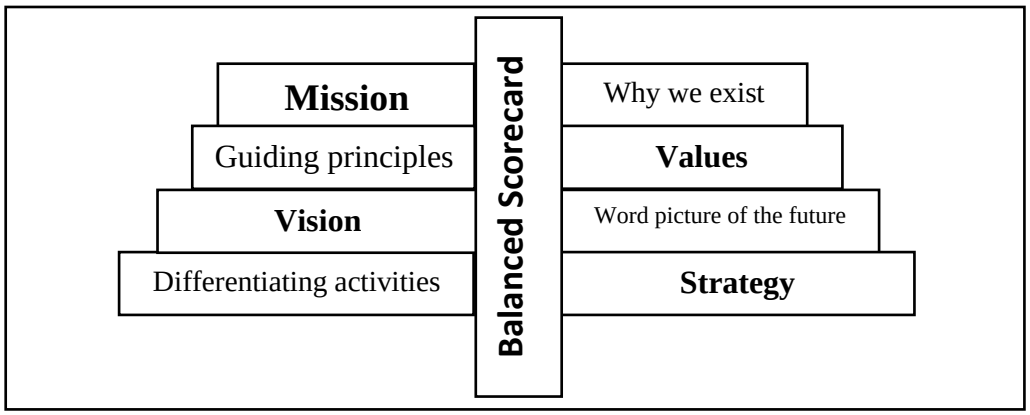

Figure 2. 13: The Balanced Scorecard Translates Mission, Vision, and Strategy

(Niven, 2006, p: 72)

The Balanced Scorecard effective components are the organization's mission, its core values, its vision and its strategy. When implemented, the organization will need to determine whether it is actually in line with its vision and strategy. The process of building a Balanced Scorecard should be preceded by clarifying the future strategic vision of the organization, which is one of the most important elements in

the development of a Balanced Scorecard. The development of a Balanced Scorecard depends on the common understanding of these important and vital elements for all members of the Organization (Niven, 2006, p: 71).

I- Mission :

The mission of an organization is the reason for its existence, it justifies its continuation (Person, 2009, p: 20). The mission statement of an organization rarely changes, it is beyond the simple increase in the wealth of shareholders, but also reflect the reason why employees are motivated to join this Organization (Niven, 2006, p: 73). The mission must be the starting point to translate the organization's vision and strategy through the balanced Scorecard to goals that appear on the strategy map, and measures for the scorecard perspectives, that are in line with the organization's ultimate aspirations and directing the actions of individual employees towards implementing the right choices (Niven, 2014, p: 105). When setting goals and performance measures, the organization has to make sure that they meet its mission.

The organization's mission emphasizes its significance by referring to the type of activities, customers and markets it serves; it represents its unique characteristics that distinguish the organization from other similar organizations and thus reflect the basic orientations of the Organization (Person, 2009, p: 20). It should be concise, clear, understandable, expressive and simple. It specifies the scope of the organization’s work, its most important values and the most important characteristic of competitors.

The Balanced Scorecard can be built and implemented without providing the organization's mission statement. In this case, the organization will miss out on huge values and alignment that it can create when developing a balanced scorecard that truly translates its mission; the mission statement is like a compass that guides the work of the entire team (Niven, 2014, p: 105).

II- Values

Values are the timeless principles that guide an organization; it represents the collective principles that employees believe in, the values in an organization are reflected in the day-to-day behavior of its employees (Niven, 2006, p: 77). These values are the result of employees and their leaders, which reflect the culture of the organization; it is rare to instil values through training courses and workshops (Person, 2009, p: 19). There may be confusion between values and practices; practices, processes, and strategies must change over time in the process of change; values are constant and provide a permanent source of strength and wisdom (Niven, 2006, p: 77). Values indicate the nature or quality of the objectives that the organization focuses on and which must make maximum efforts to achieve them. The great challenge facing leaders and employees in organizations is not to set and formulate values, but to make them the template that governs all behaviors, and daily performance.

The Balanced Scorecard is the best way to implant organization values and creates top-down alignment which is the real key wisdom (Niven, 2006, p: 81). In practice, a balanced scorecard can be used to track the extent to which the organization is anchored to its values by its employees. Scorecards based on organizations values are of great value in maintaining these values, which is a more creative challenge.

III- Vision

All of the above-mentioned elements are very important to the organization and to the balanced scorecard project. However, vision is the most important element, reflecting a picture of what the organization will be in the future, helping formulate strategies and objectives (Niven, 2006, p: 84). The vision follows the organization's mission, which shows the basic purpose for which the organization was founded.

After identifying its mission and values, the organization need to know what it wants to achieve in the future, and this is what the organization's vision means. The vision statement provides a word picture of what the organization intends ultimately to become in the future, this transition should be based on the mission and values of the organization, which is reflected through the strategy. A vision without a mission

is just a wish with no link to anything enduring. The vision includes the scope of practical activities and how the organization can see its stakeholders (shareholders, customers, employees and suppliers), leadership areas, outstanding competencies, and values that are strongly adhered to (Niven, 2006, p: 83).

The vision of the organization should not be abstract. Rather, it should describe the whole desired and possible picture, provide the basis for formulating strategies and objectives, and provide a strong vision for all members of the Organization (Niven, 2014, p: 107). Sharing the vision among all the people working in the organization is a great motivational force. It inspires everyone to work for the organization to be better than it is now; what does the organization want to be in the future, not what it should do to arrive there?(Person, 2009, p: 20-21).

As the vision is a description of the scope of activities and work adopted by the organization for the future, and within the balance of interests between different categories of stakeholders; the role of senior management is the ability to make this balanced contribution to the promotion of different aspects of performance; the ability of the organization to balance between different stakeholders leads to the possibility of using Balanced Scorecard as a methodology in which these categories see their goals and vision embodied by realistic measures and indicators, ultimately leading to better financial performance as a realistic reflection of the vision of the organization.

IV- Strategy

The application of a balanced scorecard varies from one organization to another and from one field to another, depending on the extent to which the organization has a strategy or not. In other words, the organization that has a clear and specific strategy differs in its application to the balanced Scorecard for the organization that does not have a strategy. An organization that has a strategy can use a balanced scorecard to implement this strategy; and even an organization that does not have a strategy can use a balanced scorecard to design and implement a strategy.

It is possible to develop a balanced scorecard system without a clear and concise strategy, this is the case for many organizations. The combination of financial and non-financial measures for a balanced scorecard is better known as key

performance indicators or stakeholder indicators rather than balanced scorecard indicators. The problem of this approach lies in the strength of this Scorecard, which must be derived from the strategy. The essence of strategy is not just choosing what to do, but choosing what should not be done as well (Kaplan & Norton, 1996b, p: 147). The key feature of strategy formation is to perform a variety of activities from competitors by selecting a distinct set of activities that offer the opportunity to create and deliver the unique value of its kind to customers, to be distinguished from competitors. These activities should be reflected in the Balanced Scorecard in parallel with the strategy (Niven, 2006, p: 92).

It is assumed that the balanced Scorecard should not be used in isolation from the organization's strategy and management system, but rather that it should serve as an approach that enhances the linkages and the relationship between the strategic direction and the actual management practices. This linkage ensures that the Balanced Scorecard acts as a link between the organization's strategy and the management practices of all employees. The organization must translate its strategy into goals and set appropriate measures within the four perspectives of the Balanced Scorecard.

It should also be recognized that the identification and understanding of the organization’s strategy is the starting point for the balanced scorecard project; When the strategic requirements for the success of the organization are identified and understood, the organization should select a set of measures that are consistent with the strategy and reflect the extent to which the specific objectives that lead to the successful implementation of the strategy are implemented.

B- Cause and effect relationships

The Balanced Scorecard is more than just a limited selection of financial and non-financial measures spread over its four perspectives. What distinguishes a balanced scorecard is the cause and effect relationships, which the links between its perspectives are based on. Cause and effect relationships make the balanced scorecard perspectives linked to each other, and linked to the organization's strategy and objectives.

The development of linkages based on cause-and-effect relationships between performance measures is the biggest challenge for building a balanced scorecard. However, if the organization does that, it will have more than a set of financial and non-financial measures combined; It will have a system that adapts its strategy and communicates that strategy to all its employees (Niven, 2006, p: 23).

The Balanced Scorecard is a system designed to describe the strategy and to translate it into a set of selected goals and measures. These measures must be linked together in a chain of cause-and-effect relationships from performance measures at the learning-growth level to the financial performance improvement (Niven, 2006, p: 24). This series of cause-and-effect relationships ultimately leads to financial performance. Kaplan and Norton argue that the cause-and-effect relationships between the balanced scorecard perspectives follow a specific sequence that allows a description of the mechanism by which the intangible assets of the learning and growth perspective are transformed into tangible results which represent a value for the shareholders within the financial perspective (Kaplan & Norton, 2000, p: 168). Figure 2.14 shows the cause and effects relationships between the four perspectives of the Balanced Scorecard.

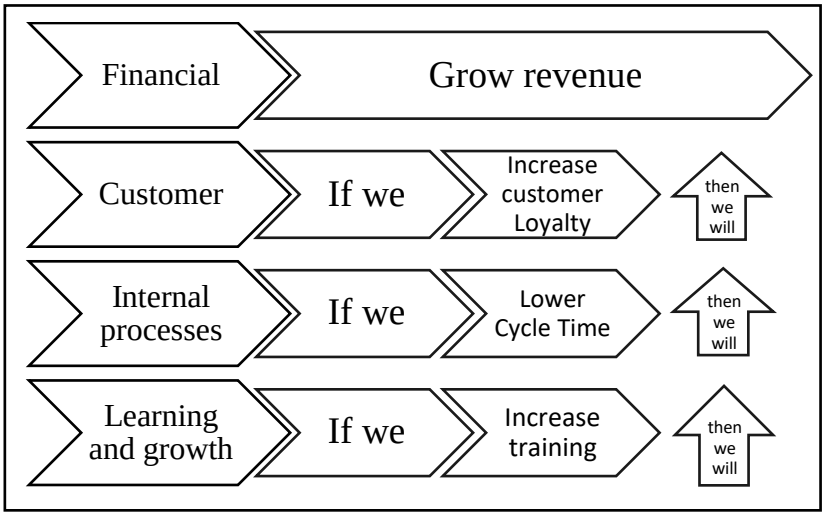

Figure 2. 14 : Cause and Effect relationships between perspectives
Adapted from (Niven, 2014, p: 15)

From Figure 2.14, we note that the learning and growth perspective measures are the engine of the internal processes perspective measures; in consequence, this latter will drive the customer perspective measures, which ultimately leads to financial results. This means that the measures of a given perspective are the leading driver for the next perspective starting from the learning and growth perspective and ending with achieving

financial results in the financial perspective. In general, these perspectives are linked together and support each other by relationships of cause and effect, which allow the organization to assess the success of its strategy in achieving its objectives. Niven gives more explanation for that using an example as shown in Figure 2.15.

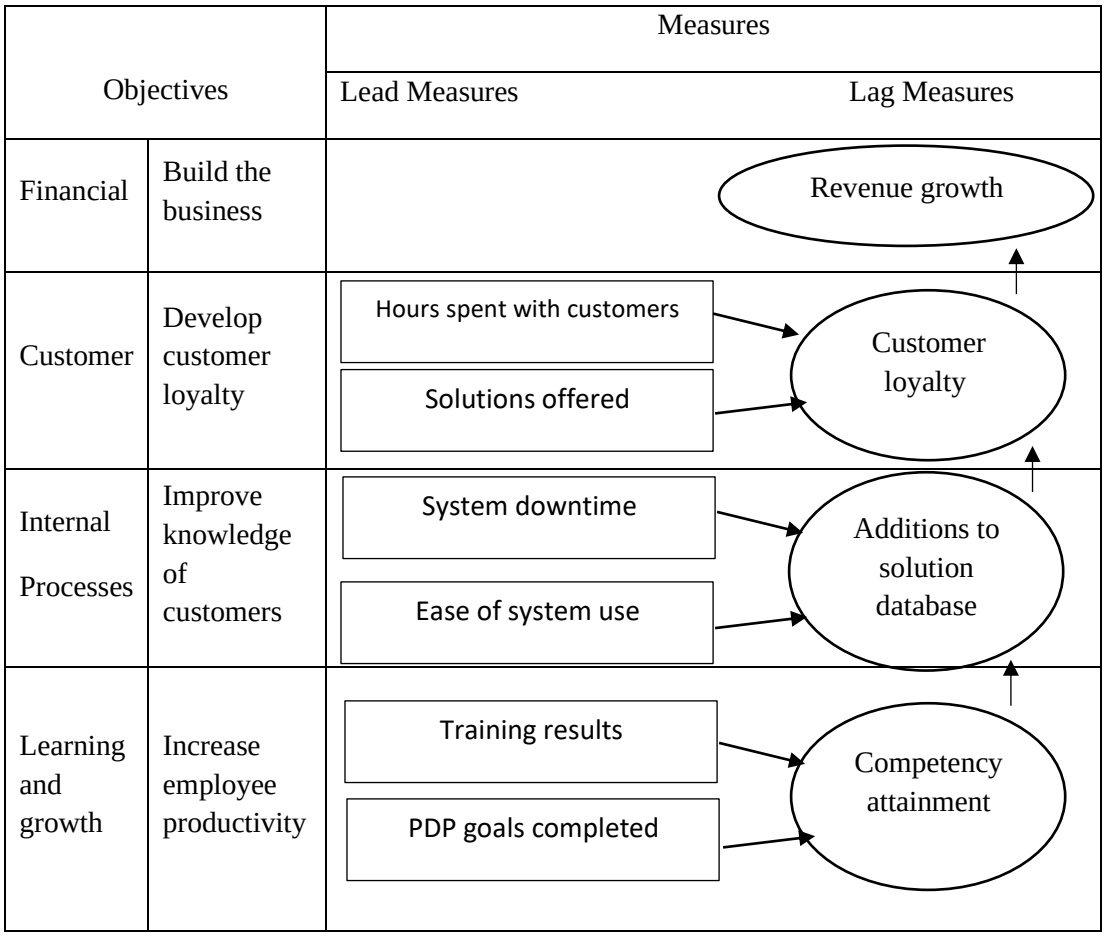

Figure 2. 15 Cause-and-Effect Linkages in the Balanced Scorecard
Adapted from (Niven, 2002, p: 167)

From Figure 2.15, the organization has decided to follow the revenue growth strategy; and now, it wants to review the Balanced Scorecard measures in order to achieve the revenue growth targets expressed in financial measures included in the financial perspective. Assuming that customer loyalty is chosen as one of the measures for the customer perspective, that loyalty can be attained by improving the employees knowledge of customers; which is a measure for the internal processes perspective. This requires that the employees competency must be enhanced through effective training programs, which can be an objective for the learning and growth perspective.

However, relying on a single measure is insufficient; other measures can describe other elements of creativity. Through a chain of cause and effect analysis, potential gaps

or missing measures that describe success can be seen (Niven, 2002, p: 168). The procedures for selecting these measures should include the chain of cause-effect relationships that deliver the strategy across the Organization (Kaplan & Norton, 1996b, p: 149).

When building cause and effect relationships, measures are launched from the four perspectives. These measures are characteristically oriented to achieve results through logical sequencing from financial projections downwards through customer measures and internal processes measures, and ultimately learning and growth measures. Once the organization has built a logical structure of results measures that extend across the four perspectives, it can determine performance measures for each perspective. There is no need to link all the lead measures together within the four perspectives, because these measures are details of the organization performance to achieve the lag measures; as a result, the lead measures are expected to be limited to a particular category (Niven, 2002, p: 166).

Cause and effect relationships can be seen from two directions, top-down and bottom-up. The causal relationship is a reciprocal interactive relationship in both directions up to the financial perspective and down from it; improving the financial performance of the organization is reflected on the other perspectives by improving its performance.

The development of a set of measures working together to describe a strategy may not only allow the organization to implement that strategy, but also to describe the importance of the value and how to create it; cause and effect relationships are a way for success because they can create interdependence between seemingly disparate elements. It is not possible to understand the work of an organization by looking at its constituent parts, but it must be seen as a whole coherent linked parts. Describing these relationships on the strategy map is the required force that makes the whole system stronger and leads the organization to implement strategy (Niven, 2002, p: 165), and allows for continuous strategic learning. The chain of causality promotes learning, and if built well, it helps to describe and communicate strategy to all employees of the organization.

C- Strategy Map

As mentioned in section one, the role of the Balanced Scorecard has moved from just a performance measurement tool to a strategic management and communication system. In their article in 2000 “Having trouble with your strategy? Then map it”, Kaplan and Norton propose a new tool that works along with the Balanced Scorecard they called it “Strategy Map”. In this section, we will address this tool, by discussing its concept and its general model.

I- The concept of Strategy Map:

For many organizations' strategies, the problem is how to make strategy and strategic objectives clear to everyone inside the organization. In this matter, the Balanced Scorecard can offer a useful framework for strategic alignment; however, as Kaplan and Norton argue, it has to be completed with the strategy map tool. The strategy map for the Balanced Scorecard makes the organization's strategy explicit by showing each measure in the BSC in a series of cause-and-effect links that connect the desired outcomes from the strategy with the performance drivers that will achieve the strategic objectives. Kaplan and Norton state that "The strategy map describes the process for transforming intangible assets into intangibl customer and financial outcomes" (Kaplan & Norton, 2001, p: 69). intangible customer from another point of view by focusing on the relation with the Balanced Scorecard, he argues that "Strategy Map a one-page graphical representation of what you must do well in each of the four perspectives in order to execute your strategy successfully" (Niven, 2006, p:18).

Kaplan and Norton (2001) assert that the strategy maps reinforce the organizations to see their strategies in unified, incorporated, and systematic way, which gives the basis to the management framework to implement strategy effectively and quickly (Kaplan & Norton, 2001, p: 69). Furthermore, Kaplan et al. contend that the "strategy map brings together all of an organization's strategic objectives to illustrate causal linkages" (Kaplan, Norton, & Rugelsjoen, 2010, p: 116). The use of this tool can provide a clearer view of how to attain the strategic objectives through the four perspectives of the Balanced Scorecard.

According to Olve et al (2003), the Balanced Scorecard is utilized as an instrument for showing strategy in the organization. They emphasize that the strategy map satisfies the next purposes (Olve et al., 2003, p: 126):

- Allowing discussion about cause-effect relationships when facing strategic decisions and about possible strategic actions.
- Assisting managers to find and selecting metrics to manage activities.
- Communicating strategies and their integral logic.

The strategy map is an effective instrument to describe the strategy, it specifies the critical factors and their linkages for an organization's strategy (Kaplan & Norton, 2001b, p: 90). The strategy map tries to answer two central issues for managers, how does their organization intend to succeed? and how can they know whether it is succeeding? (Olve et al., 2003, p: 126).

II- The general model of the Strategy Map

According to Kaplan and Norton, the strategy map should be built on the strategic themes of the organization; these themes represent the managers' perspective of what they have to do to meet the strategic objectives. As illustrated in Figure 2.12, an organization's strategy can be seen through four themes (Kaplan & Norton, 2001, p:78-79):

- **Build the franchise:** the long-term value creation by developing new products and services and penetrating new markets and customer segments
- **Increase customer value:** managing relationships with existing customers through multiple sales cycles
- **Achieve operational excellence:** the short-term value creation through internal throughput management in order to provide efficient, zero defect, and to produce and deliver to customers on time. And also, the management of asset utilization.
- **Be a good corporate citizen:** managing relationships with external stakeholders, especially in industries subject to regulation or safety and environmental risk .

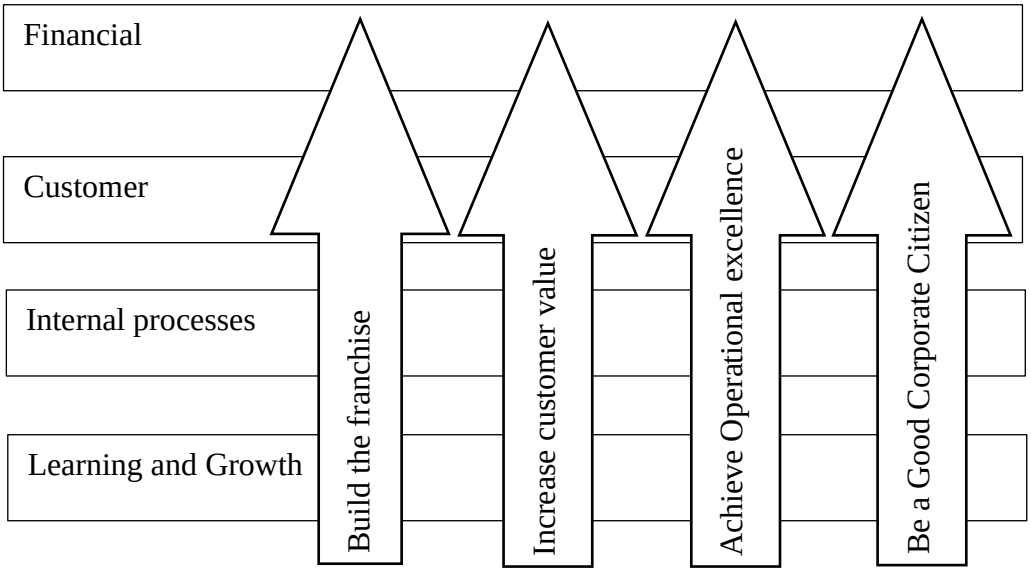

Figure 2. 16 : Architecture of a Strategy Map

(Kaplan & Norton, 2001, p: 79)

The use of these strategic themes reflects the variety of strategic objectives, each one of them comprises cause-and-effect links through the four perspectives of the Balanced Scorecard. Key performance indicators, measures, targets and initiatives are then established within each perspective based on the strategies adopted through the strategy map. As shown in Figure 2.12, the idea is that the organization use the internal processes, based on its intangible assets, seeking to satisfy its customers in order to achieve its financial objectives. The strategy map starts from the financial perspective and ends in the learning and growth perspective.

1- The financial perspective:

The ultimate goal of any profit-seeking organization is to increase shareholder value. Kaplan and Norton argue that the organization has two possible methodologies to increase economic value, revenue growth and productivity. A revenue development policy has two components: expand the activity to new markets, with new products, and new customers; or enhance relationships with the current customers in order to increase sales with them. The productivity methodology also, in general, has two segments: enhance the cost structure by bringing down direct and indirect costs; and use assets all the more efficiently by decreasing the working and fixed capital needed for each period (Kaplan & Norton, 2001b, p: 90).

2- The customer perspective

The customer value is at the center of any organization's strategy, this value is described by a mix of product, price, service, relationship, and image that the organization proposes to its customers. According to Niven and Kaplan and Norton, the organization has to build its own value proposition model in order to answer these questions (Niven, 2005, p: 69):

- How do we buy the product or service?
- Why do we buy?
- What need is the product or service satisfying?
- How long will the need last?
- What is the competition doing?

The value proposition model for the customer perspective in the strategy map is composed of three main elements (Niven, 2005, p: 69 and Kaplan & Norton, 2001, p: 86-87):

- **Operational excellence:** Organizations seeking operational excellence give more importance to lower prices, conveniences, and ease of purchases that no competitor can offer.
- **Product leadership:** Organizations that are in the product leadership field focus on improving the functionality of the current product or producing new products and should take the time required to deliver these products to customers and the market in the optimal time. These organizations have been open to innovation and development. Its relationships and costs are not very important under this strategy.
- **Customer intimacy:** Organizations in the field of customer intimacy rely heavily on deepening their relationships with customers and proposing complementary solutions and services so that you know them well whom you are dealing with. And the type of products and services they are looking for, so their image is based on mutual trust.

From the customer perspective also, the organization can identify the expected results from bringing a differentiated value proposition to customers. According to this, the organization may use outcomes like the market share in targeted customer segments, the account share with targeted customers, the acquisition and retention of customers in the targeted segments, and customer profitability.

3- The internal processes perspective

From the internal processes perspective, the organization faces the real translation of its objectives and strategies to satisfy its customers and shareholders. At this level, the organization must direct its internal activities and processes to allow the achievement of the customer and financial outcomes. As shown in Figure 2.12, the strategic themes may be used to guide this operation (Kaplan & Norton, 2001b, p: 93):

- Build the franchise by spurring innovation to develop new products and services and to penetrate new markets and customer segments.
- Increase customer value by expanding and deepening relationships with existing customers.
- Achieve operational excellence by improving supply-chain management, internal processes, asset utilization, resource-capacity management, and other processes.
- Become a good corporate citizen by establishing effective relationships with external stakeholders.

4- The learning and growth perspective

The final step in the strategy map is the identification of the intangible assets needed to support the organization to perform its activities at a higher level of performance in order to meet the strategic themes. Kaplan and Norton claim that there are three principle categories for the learning and growth perspective in the strategy map (Kaplan & Norton, 2001, p: 93):

- **Strategic competencies:** The strategic skills and knowledge required by the personnel to support the strategy
- **Strategic technologies:** The information systems, databases, tools, and networks required o support the strategy

- **Climate for action:** Thblcultural shifts needed to motivate, empower, and align the personnel behind the strategy

These three principles reflect the important role of intangible assets in their forms: human capital, information capital and organizational capital. The idea from the strategy map is how can the organization exploit these capitals and transform them into actions that enable it to achieve the objectives in the internal processes, customer and financial perspectives.

When measuring the organization performance, it is so mistaken to look only on financial measures, performance is something greater, more comprehensive, deeper and more complex. As a solution, the Balanced Scorecard has been shown to reflect the balance between financial and non-financial measures, short- and long-term objectives, tangible and intangible assets, , And between perspctives of internal and external performance.

The Balanced Scorecard can play three main roles; the first role is a performance measurement system by usnig financial and non-financial measures from the four four balanced points of view: the financial perspective, the customer perspective, the internal processes perspective and the learning and growth perspective. Secondly, BSC can be used as a strategic management system, through the translation of the organization's vision and strategy into a specific set of objectives and measures that include all levels of the organization and work on its implementation. The final role of BSC is that it can be used as a communicative tool through the whole organization; in an organization that uses BSC, employees at all levels can understand how to participate in attaining its objectives and implementing its vision and strategy.

The strategic use of the Balanced Scorecard can be explained by the strategy map, this tool might show how to transform intangible assets into tangible financial results. A strategy map starts from the learning and growth perspective by asking how the human capital , information capital and organizational capital enhance the internal processes performance, which improves customer loyalty and ultimately, raise financial results. Moving from one perspective to another is based on cause and effect relationships by linking objectives and measures between perspectives.

Chapter Three: Strategic cost management and Strategic Decisions Making

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Section One: Strategic Cost management

A- The Strategic Role of Cost Management

In the new business world, cost management has turned into a basic instinct for some organizations. However, it isn't adequate to just reduce costs; rather, costs must be managed strategically (Cooper & Slagmulder, 1998, p: 14). Numerous writers focused on the fact that the strategic significance of cost management has radically expanded in the ongoing years because of exceptional competition. As indicated by Cooper and Slagmulder (1997), clients in highly competitive markets expect that every new product or new upgrades present changes. These upgrades may include enhanced quality, enhanced usefulness or decreased costs. Any of these enhancements alone or any blend of them encourage a firm to deal with its costs to remain profitable (Cooper & Slagmulder, 1997, p: 108).

Moreover, Cooper and Slagmulder (1997) called attention to that in the highly competitive markets, the organization might not get high-profit margins, not find such loyal customers, and the first-mover advantages will be below. Not just customer request cost management, likewise the competition between all-around competitors builds the strategic significance of cost management (Cooper & Slagmulder, 1997, p: 168). Cooper and Slagmulder contended that in competitive markets where competitors are frequently technologically equivalent, it turns out to be progressively hard to keep up a sustainable competitive advantage. In Japanese competitive markets, they found that even before a differentiator can show its customers the typical advantage of a new product, different companies launch me-too products at even lower prices. Similarly, cost leaders, offering products that are low in price, are jumped by competitors, offering products at a similar price but with a higher level of quality and/or more features (Cooper & Slagmulder, 1997, p: 181). This reality leads them to infer that in a universe of non-manageable competitive advantage, a firm that neglects to reduce costs as quickly as its competitors will discover its profit margin pressed and its reality debilitated. Thus, all organizations need to manage costs forcefully, keeping in mind the end goal to make due in the present exceptionally competitive markets.

Likewise, Kato (1993) contended that while manufacturing Japanese organizations are altogether cost-aware organizations, they additionally seek differentiation strategies (Kato, 1993, p: 37). This implies manufacturing Japanese organizations are both cost leaders

and product differentiators. Likewise, Monden and Hamada (1991) argue that in very competitive markets - that is portrayed by a shortening of product life cycles, enhancement of interest, and sharp rivalry – cost management is basic to present new products that meet clients' requests at the least cost and to lessen costs of existing products by wiping out squanders (Monden & Hamada, 1991, p: 16). At last, Cooper and Slagmulder (2004) think about the strategic significance of cost management with that of quality management and conclude that cost management needs to end up a teach rehearsed by practically every individual in the firm. Abridging, in the contemporary business condition, all organizations need to make progress toward cost management so as to survive (Cooper & Slagmulder, 2004, p: 51).

B- Strategic Cost Management Concept

Strategic cost management is comprehended in various paths in literature. Cooper and Slagmulder (1998) contended that strategic cost management is "the application of cost management techniques so that they simultaneously improve the strategic position of a firm and reduce costs" (Cooper & Slagmulder, 1998, p: 14). They recommend three sorts of cost management initiatives, in view of whether the effect on the association's competitive position is positive, negative or neutral. A case of a cost management initiative that reinforces an organization's position is delineated as takes after. A healing center overhauls its patient confirmation technique so it turns out to be more proficient and simpler for patients. The healing center will wind up known for its simple affirmation method so more individuals will go to that doctor's facility if the patient has a decision. The strategic position of the clinic has quite recently been expanded over its competitors.

The second case of a cost management initiative that has no effect on the organization's competitive position is clarified as takes after. An insurance agency chooses to rethink its records payable framework to make it more effective. The assessment has no positive advantages to the insurance agency in the outside market. The goal of the change is to make the association more productive. The third case of a cost management initiative that will debilitate the organization's competitive position is outlined as takes after. An expansive aircraft organization just has two work areas for regulating and offering tickets. This set-up incites long queues for the aircraft customer which can at last outcome in high disappointment and awful notoriety for the carrier. This may decrease the measure of ticket deals when contrasted and the carrier's rivals. Despite the fact that having just two work areas accessible for customers may at first be cost-successful, over the long haul, it hurts the

organization. When in doubt, an association ought to never attempt any practices that are anticipated to debilitate the situation of the organization.

Moreover, Cooper struggled that strategic cost management needs to incorporate all parts of the product production and delivery; the purchased parts supply, the product design and manufacturing. In this way, strategic cost management ought to be characteristic to each phase of a product's life cycle, (within the development, assembling, transportation and among the after-sale services of the product (Cooper, 1995, p: 87). Wolfie and Keltyka argue that strategic cost management is an area that holds exciting possibilities for accountants (Welfle & Keltyka, 2000, p: 34). They highlighted that strategic cost management endeavours to enhance the strategic position of an organization and reduce costs in the meantime, and it is vital in light of the fact that worldwide competition implies that organizations must be continually aware of their strategic position. The firm should compete in: quality, cost, customer service, and suppleness with any cost reduction effort adding to an enhanced strategic position. A modern comprehension of an organization's cost structure can go far in the look for practical competitive preferred standpoint; this point is underlined by Shank and Govindarajan who characterize strategic cost management as "the managerial use of cost information explicitly directed at one or more of the four stages of strategic management (Shank & Govindarajan, 1993, p: 06):

- Strategies formulating,
- Strategies communicating,
- Strategies implementation and tactics development,
- Strategies controls and objectives' success monitoring."

Finally, strategic cost management should begin with participation during the R&D and design stages of the product in order to avoid the costs early in the product life cycle.

Also, as indicated by Shank & Govindarajan, strategic cost management has risen as a key component to achieve and support a strategic competitive advantage through long-run expectation and arrangement of the costs level, structure, and behavior standard for processes, products, and recourses. For this reason, strategic cost management must give managers diverse information. Strategic cost management look at products, procedures, and resources as original items for achieving strategic competitive advantage. This objective may not be accomplished in light of conventional cost management (Shank & Govindarajan, 1993, p: 25). They additionally contend that strategic cost management must fix and evaluate

long term cost factors and their impact on the level, structure, and behavior of costs. Strategic cost management should start with investment within the R&D and design phases of the product, keeping in mind that the end goal is to avoid the costs ahead of schedule in the product life cycle.

Porter also has contributed to the development of strategic cost management; He recommended that a firm can choose three generic strategies to obtain and sustain a competitive advantage. These strategies are leadership, differentiation, and focus (Porter, 1998, p: 10). Where cost leadership is chosen Porter supports the utilization of strategic cost analysis. The first step to perform a strategic cost analysis is to distinguish the firm's value chain, which can be characterized as the linked activities from supply to delivering the product to the final customer.

Also, Porter argues that costs in the organization have different drivers, these cost drivers work in a cooperative way, and it is management's accomplishment in adapting to them that decides the cost structure. The strategic cost analysis additionally includes recognizing the value chain and the task of cost drivers of competitors so as to comprehend relative competitiveness. He suggests that firms should utilize this information to distinguish open doors for cost reduction, either by enhancing control of the cost drivers or by reconfiguring the value chain. This includes settling on those zones of the value chain where the firm has a comparative advantage (Porter, 1998, p: 12). It is fundamental that the cost reduction performance of both the organization and its main competitors is ceaselessly observed if competitive advantage is to be managed.

According to Hinterhuber (1997), strategic cost management should be included in the strategy of organizations so as to accomplish a thorough and long-term rise in the value of the organization. Strategic cost management needs the help of personnel, top management and additionally information technology in light of the fact that successful and opportune communication is essential for realizing it. At last, strategic cost management needs to take into consideration the value systems, convictions, and projections of employees; changes in business forms and in the ways activities are performed need to be maintained by incentive and other non-money related systems, strategic cost management needs to make win/win circumstances and to impart the advantages viably for all included (Hinterhuber, 1997, p: 10-13).

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Henceforth, the term strategic cost management has a wide concern, it isn't bound to the persistent reduction of costs and controlling of costs and it is unmistakably concerned with management's utilization of cost data for decision-making. Strategic cost management is additionally not kept to utilize cost management methods that reduce costs and enhance the strategic position of a firm in the meantime. At the point when most writers discuss strategic cost management, they are truly considering cost reduction. In any case, usually hard to depreciate the significance of cost factors for the success of the organization; however, the test is to expand revenue, which can be encouraged by strategic cost management. Strategic cost management is imperative to organizations since it is more than concentrating on costs; ineffective organizations, costs won't be the main most vital factor, yet additionally, value and revenue are basic factors in the achievement of organizations. At this point, El Kelety advocates that strategic cost management is a tringle as shown in Figure 3.1: philosophy, an attitude, and a set of techniques (El Kelety, 2006, 65):

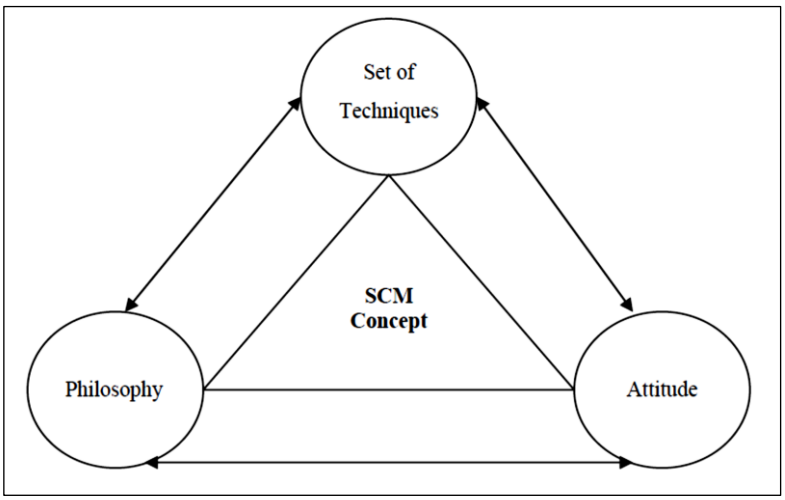

Figure 3. 1 : Strategic cost management-Concept

(El Kelety, 2006, 65)

- **Philosophy**: strategic cost management is a philosophy of enhancing cost and income; strategic cost management isn't just cost management yet additionally revenue management. Hence, it is looking to enhance productivity, boost benefit, and enhance customer fulfilment.
- **Attitude**: strategic cost management characterizes a practical attitude that all costs of the products and services resulting from management choices inside the organization and with customers and suppliers.

- **Techniques**: strategic cost management is a set of dependable techniques. These techniques or instruments might be utilized independently to assist a particular objective or together to serve the general needs of the organization. A set of strategic cost management techniques that work together to service the organization's objectives and activities is known as a strategic cost-management framework (El Kelety, 2006, 65-66)

C- Comparison between Strategic and Traditional Cost Management

Strategic cost management must cross over any barrier amongst cost and value and in addition between the language of the market and the language of the business. Conventional cost management in the twentieth century confronted numerous reactions, be that as it may, strategic cost management amid the 21st century faces a future that will be exceptional and compensating contrasted with its present substances. The key differences between traditional and strategic cost management are stated in Figure 3.2.

	Traditional Cost Management	Strategic Cost Management
Focus	Internal	External
Perspective	Value-added	Value chain
Cost analysis-way	In terms of: product, customer, and function With a strong internal focus Value-added is a key concept	In terms of the various stages of the overall value chain of which the firm is a part With a strong external focus Value-added is seen as a dangerously narrow concept
Cost analysis-objective	Three objectives all apply, without regard to the strategic context: Scorekeeping, attention directing, and problem-solving.	Although the three objectives are always present, the design of the cost management system changes dramatically depending on the basic strategic positioning of the firm: either under a cost leadership strategy or under a product differentiation strategy.
Cost driver concept	A single fundamental cost driver pervades literature - cost is a function of volume. They are applied too often only at the overall firm level.	Multiple cost drivers such as: Structural drivers (e.g. scale, scope, experience, technology, complexity) Executional drivers (e.g. participative management, total quality management) Each value activity has a set of unique cost drivers.
Cost containment philosophy	Cost reduction approached via responsibility centers or product cost issues	Cost containment is a function of the cost driver(s) regulating each value activity.
Primary concern	Cost impact	Cost/Value/Revenue relationship
Key disciplines	Finance/Accounting	Marketing/Economies
Primary role	Scorekeeper	Analyst and consultant
Management responsibility	Follower/reactive Risk-averse	Leader/proactive Comfortable with ambiguity

Figure 3. 2 : Comparison of traditional and strategic cost management

(Shank & Govindarajan, 1993, p: 217 and El Kelety, 2006, p: 68)

Section Two: Strategic cost management tools and their relationships with ABC/M.

A- Target costing

In the past, most practices of cost reduction and cost control such as standard costing and budgeting was focused on the production stage, these methods deal with production costs by fixing standard costs and budgets for each department, and periodically analyzing the variations between actual costs and standard costs. As a matter of fact, however, even production costs start to show up in the production stage, but decisions about the level of these costs have been taken in the early stage of the product life cycle. Thus, in order to better cost control and management, efforts must be focused on the product design and planning stage.

Relying on this idea, many Japanese companies such as Toyota, Nissan, Sony, Daihatsu and others use the idea of influencing and reducing product costs as early as possible during the planning and development stages of a product. This practice was called in Japanese *"Genka Kikaku"*, it was translated later into "target costing" and officially named "target cost management" at the annual meeting of the Japan Cost Society in 1995 (Feil, Yook, & Kim, 2004). After that, target costing has spread to the United States and other western companies.

Target costing is more than a costing system, it is about the long-term success of the company. It is considered a tool for strategic cost management; this implies that its main focus is on long-term cost management rather than the short-term focus adopted by more traditional cost accounting systems (Ewert & Ernst, 1999). In this element, target costing will be argued and the link to ABC/M will be shown.

I- Concept of Target Costing

1- Target costing definition:

There is no generally accepted definition of target costing. Some researchers argue that many Japanese scholars do not themselves agree on the exact meaning of *"Genka Kikaku"* (see e.g. Feil, Yook, & Kim, 2004). There are a number of different concepts and definitions. For example, SAKURAI (1989) says "…target costing can be 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, marketing and accounting

departments.” (Sakurai, 1989 **In** Feil, York, & Kim, 2004) This definition focuses on the purpose of target costing, which According to Sakurai is cost reduction, and also, he mentions cross-functional coordination. A similar definition is given by Cooper and Slagmulder (1997). They state that "Target costing is a structured approach to determine the life cycle cost at which a proposed product with specified functionality and quality must be produced to generate the desired level of profitability over its life cycle when sold at its anticipated selling price". The additional point of view to the first definition is profitability enhancement rather than cost reduction. Cost reduction, according to the writers, becomes a means to attaining target profit. They add that "target costing is as much a tool of profit management as it is of cost management" (Cooper & Slagmulder, 1997, p: 72).

Kato (1993) enter the customer requirements as a boundary of cost reduction, he claims that reducing costs should be in light of customer value. He argues that "…In reality, target costing is not a cost quantification technique, but rather a complete cost reduction program, starting even before the first drawings of the product has been prepared. It is an approach aimed at reducing the cost of new products throughout their life cycle, while meeting consumer requirements in terms of quality and reliability, among others, examining all conceivable ideas relating to cost reduction at the planning, development and prototyping stage. Target costing is not a simple cost reduction technique, but a complete strategic profit management system" (Kato, 1993,).

Although this presentation shows deferent points of view toward target costing but some common points can be found in all the definitions above:

- Both the target price and profit are determined before the calculation of costs;
- Target costing implementation needs a cross-functional team to be successful; and
- Cost planning at the beginning of the product life cycle reduces costs incurred over the life cycle stages.

Even target costing seeks to enhance profitability and reduce costs incurred over all the life cycle stages, but some writers argue that it is only appropriate in the first stage of the product life cycle. For example, Kaplan and Atkinson (1998) and Atkinson et al. (2012) argue that target costing is a method in which product designers and cost planners use before the product is in production. However, when the product enters the manufacturing stage, another tool of cost reduction is used. This tool is kaizen costing (Atkinson & Kaplan, 1998, p: 229; and Atkinson, Kaplan, Matsumura, & Young, 2012, p: 306-307).

According to Monden & Hamada (1991), Kaizen costing includes cost reduction in the manufacturing stage of existing products. At the same time, target costing is applied in the developing and designing phase of an entirely new model, a full model change or a minor model change.

Target costing is based on the simple idea that costs must be managed before they accrue, through design and development stage. Costs become then, an input for the product design process, not an output data. Target costing idea may be expressed in a simple equation as follow:

Target Cost = Target price - Target profit

The cost in this approach is the dependent variable, prices are determined by what customers are willing to pay, and profit is determined by what financial markets expect as a return from that particular industry (Ansari, Bell, & Okano, 2006, p: 513). Target costing is then a price-based costing not a cost-based pricing approach.

2- Target Costing characteristics:

As a reason for the absence of a widely accepted definition of target costing, researchers have tried to explain more this approach by articulating the characteristics or key principles. Ansari et al (2006) state that the first comprehensive statement of target costing boundaries was established by CAM-I. The CAM-I model established six key principles for target costing. These are as follows (Ansari, Bell, & Okano, 2006, p: 513):

- **Price Led Costing**: The allowable cost is calculated in function of a market-determined price.
- **Customer Focus**: Product design is shaped continuously by the voice of the customer. Enhancements of product features take place only when they meet customer requirements and customers are willing to pay for them.
- **Design Centered**: The key to cost management is to design costs out of a product before committing to production as opposed to relying on economies of scale, learning curves, waste reduction, and yield improvement to reduce costs.
- **Cross-functional teams**: Cost management requires a cross-functional team that includes design and manufacturing engineering, production, sales and marketing, material procurement, cost accounting, and service and support. Involvement of downstream functions during design helps to avoid problems that might occur later.

- **Life Cycle Orientation**: Target costing typically models the costs of owning a product over its entire life. It considers purchase price, operating costs, maintenance and repairs, and disposition costs with a view to minimizing life cycle costs.
- **Value Chain Involvement**: Significant members of the value chain, such as suppliers, dealers, distributors, and service providers, participate in the target costing process. A target costing system relies on its value chain to participate as an extended enterprise to create customer value and minimize costs.

Target costing is a strategic cost management tool, which can lead to a profitable business in the competitive marketplace. It uses a market-oriented product design in order not to exceed target costs. For a successful target cost implementation, there are steps should be undertaken. The target costing process is explained in the next element.

II-Target costing process:

As the research in target costing concept has resulted some different definitions, target costing process is also a subject of deferent points of view. For example, Cooper and Slagmulder (1997) state that the target costing process should respect three major phases: **(i) Market-driven costing:** use the market information and the long-term objectives to determine the target price and profit margin. Then, fixing the allowable cost of the product. **(ii) Product-level target costing:** the product designers seek to set the product-level target cost. **(iii) Component-level target costing**: This phase decomposes the product-level target cost to the component level. The component-level target costs identify how much the firm is willing to pay for the components it purchases (Cooper & Slagmulder, 1997, pp: 74-75).

These major phases can be broken into detailed-level steps. The study of the Institute of Management Accountants IMA (1994) present target costing process in eight detailed steps as follow (Institute of Management Accountants (IMA), 1994):

1- Establishing the Target Price:

The first step in implementing target costing is to determine the selling price of each product. In target costing approach, the price should be established not on a cost base as in the traditional practice (price = cost + profit). The target price in target costing is based on the competitive market and customers' requirements. The principal point is that companies employing target costing base their target price on market and competitive conditions, and

on their long-term pricing and market penetration objectives (Institute of Management Accountants (IMA), 1994).

2- Establishing the Target Profit Margin and Allowable Cost:

Once the target price has been established, a target profit margin should be calculated. The objective in setting target profit margins is to ensure the achievement of the firm's long-term profit plan. Cooper and Slagmulder (1997) argue that firms set target profit margins in two ways. The first starts with the actual profit margin of the predecessor product and then adjusts for changes in market conditions (Cooper & Slagmulder, 1997, p: 100). While Kato (1993) states that the target profit for a particular product should be driven by corporate strategic profit planning (Kato, 1993, p: 40). The target profit margin should be realistic and adjusted for the life cycle.

Once the target price and profit margin have been established, the allowable cost that the company can commit to the product in question can be calculated as the difference between the target price and target profit margin. The allowable Costs are the maximum costs to attain the target profit (without consideration of actual technology or process standards) (Feil et al., 2004, p: 16). It does not mean that the firm has the ability to achieve this cost. So, the next step is to compare the allowable cost with the current cost in order to fix a final target cost.

3- Determining the Current Cost and Target Cost:

In many cases, when the given product is a new model for an existing product model, the existing information about costs can provide a base on which costs of the new model can be determined. The next step in the target costing process, then, is to determine what the new product's costs would be, using existing product specifications and manufacturing processes. These is frequently called the "engineered costs." Sakurai uses the terms "drifting costs" and "current costs." (Institute of Management Accountants, 1994, p: 11).

The current cost of the new product is determined by summing the current manufacturing cost of each major function of the new model. Cooper and Slagmulder (1997) assume there are no assumed cost-reduction activities in computing the current cost of the product. For the current cost to be meaningful, the major functions used in its construction have to be very similar to those that eventually will be used in the new product (Cooper & Slagmulder, 1997, p: 109).

To determine the target cost, product designers have to improve the product concept and design in order to "drift" (as Sakurai would say) the current cost to the allowable cost. At this stage, an important tool called value engineering is needed. Cooper and Slagmulder (1997) define value engineering as a systematic, interdisciplinary examination of factors affecting the cost of a product with the aim of devising a means to achieve its specified purpose at the required standards of quality and reliability and at an acceptable cost (Cooper & Slagmulder, 1997, p: 80). Here, the writers see target costing and value engineering as two separate disciplines, while others such as Ansari et al. (2007) see value engineering as an integral part of target costing (Ansari, Bell, & Okano, 2006, p: 512).

With the use of value engineering, product designers start with a current cost that is higher than the target cost and that across the design process reduces the expected or drifting cost until it finally reaches the target cost.

4- Disaggregating the Target Cost to Components and Functions:

The target cost determined in the precedent step is established at the product level, the next step is to subdivide that cost to the components and functions level. Fixing a target cost for each product component or function can provide a clear and detailed explanation of product cost and give the firm a base on which it can negotiate with suppliers in order to achieve the target cost. Cooper and Slagmulder (1997) argue that target costs for components can be set only when the product design has reached the stage at which specific components can be identified (Cooper & Slagmulder, 1997, p: 150).

5- Realizing the Target Cost

The process of achieving the target cost is driven by three essential principles. First, it is essential to use a cross-functional team of participants who are affected by, and can affect, the product and process specification process. Second, the team's participation early in concept design and development will greatly affect product life cycle costs (Institute of Management Accountants, 1994, p: 13). At this stage, Cooper and Slagmulder (1997) state several engineering techniques can help product designers find ways to reduce the costs of products. They include value engineering VE, design for manufacture and assembly DFMA, and quality function deployment QFD (Cooper & Slagmulder, 1997, p: 126).

6- Monitoring the Target Costing Process

After the target costing process has been accomplished, the firm needs to track how well the objectives are being reached. The firm must continuously examine if the customers' wants and needs are being satisfied, are competitors behaving as expected? If not, what are the implications of their actions? Is the target price still valid? If not, what is the impact on allowable and target cost objectives? (Institute of Management Accountants, 1994, p: 15).

Cooper and Slagmulder (1997) argue that there are many factors that can influence the target costing process along the product life cycle. The intensity of competition and the nature of the customer can shape the market-driven costing, this means they influence target price and target profit. While factors like the firm's product strategy and the characteristics of the product can help shape the product-level target costing section of the target costing process. They guide the firm to control the nature and extent of the information collected about historical cost trends and customer requirements (Cooper & Slagmulder, 1997, p: 150). Finally, the firm's supplier-base strategy factor may influence the component-level target costing section of the process. This strategy helps determine the benefits that can be derived from component-level target costing because it shapes the amount of information the firm has about the costs and design capabilities of its suppliers.

Understanding those factors can give the company an analysis tool to monitor the target costing process, and lead to better assessment of target cost objectives.

7- Enhancing Target Costing with Kaizen Costing

Leading companies are always looking for ways to eliminate waste and reduce costs, even after a product has gone into production. Modifications to the product and its design, supplier management efforts, and continual process improvement initiatives are all part of the kaizen costing effort (Institute of Management Accountants, 1994, p: 16).

Monden and Hamada (1991) argue that target costing and kaizen costing when linked together, constitute a total cost management system, which implies cost management in all phases of the product life cycle. Target costing focus on the long-term profit enhancement, by using the product design to reduce costs of the product overall its life cycle stages. Thus, the target costing process end at the beginning of the manufacturing stage; at this stage, Kaizen costing can be an instrument for realizing short-term profit objectives (Monden & Hamada, 1991, p: 17).

The target costing process starts with the market information and the customers' requirements, the firm uses that information in order to determine the target selling piece. After that, the target profit margin is established based on the long-term profitability objectives. Then, the firm determines the allowable cost of the product, as the difference between the target price and the target profit. Since the allowable cost is driven by external factors like the competitive position and the customer's demand, it does not mean that this level of cost can be achieved by the internal capabilities of the firm. The designers can use the existing information about the ongoing product costs as a guide to determine the final target cost. As the current cost exceeds the allowable cost, it must be drifted using tools like value engineering to reach the target cost level. The target cost should be set not only for the product as a whole but also for each component or function in order to give the firm a base on which it can negotiate with suppliers in order to achieve the target cost. Once the development and design stage is finished, the target cost is established. The firm needs to monitor the target cost by understanding the factors that influence the target costing process; at the same time, it is important to use kaizen costing to offer continuous improvements in order to reduce costs in the manufacturing stage.

III- Links between Target Costing and ABC/M :

Both ABC/M and target costing are strategic tools of cost management, target costing seeks to reduce costs overall the life cycle stages by focusing on the first stages of the product life cycle in order to design a product with a cost that leads to achieving the target profit if sold at the target price. ABC/M have two main aspects, the cost assignment aspect. ABC can provide accurate cost information about products and activities as well, while the process aspect ABM gives managers an opportunity to reduce costs by clarifying how the activities and processes are being performed and highlighting the non-value-added activities. SAKURAI (1996) argue that ABC/M and target costing are used for different purposes as Figure 3.1 shows. ABC/M focuses on product profitability analysis and process reengineering, while target costing’s main purpose is strategic cost management.

Tools	*Main Purpose*	*Cost Elements*	*Emphasis*
ABC	Product Profitability Analysis	Overhead	Cost assignment for managerial decision making
ABM	Process reengineering	Overhead and direct costs	Process improvement
Target costing	Strategic cost management	Direct cost and overhead	Cost reduction

Figure 3. 3: Relationships between ABC, ABM, and Target Costing

(Sakurai, 1996, p: 124 **In** Institute of Management Accountants (IMA), 1998)

Many studies have examined the interaction relationships between the two approaches, and find that ABC/M can be useful for target costing in two ways: (1) ABC can provide a cost information basis to determining the target cost, and (2) ABC/M present an effective tool to monitor the target cost in the manufacturing stage. Figure 3.2 illustrate how can target costing and ABC/M can be integrated.

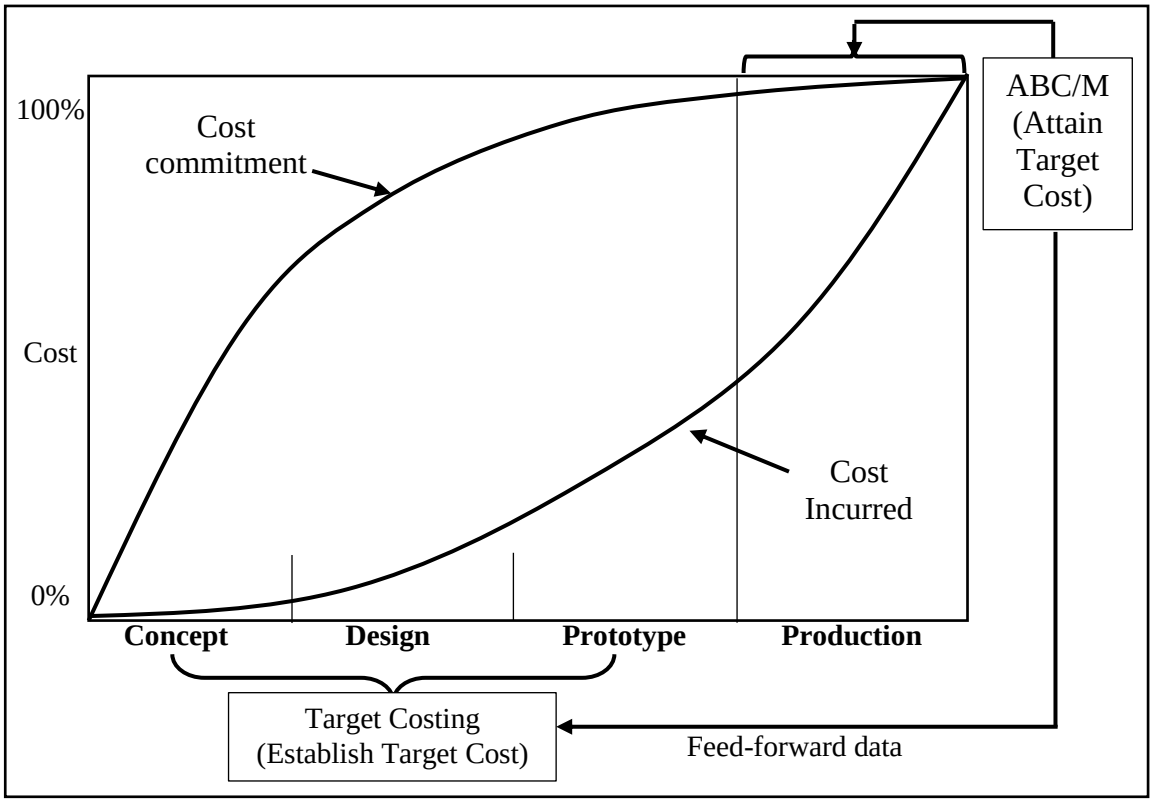

Figure 3. 4 : Integrating target costing and ABC/M

(Cokins, 2002, p:14)

At the design and development stage, product costs are even harder to estimate, since this phase consists of many activities that are not directly linked to the finished product. Ben-Arieh and Qian (2003) argue that Costs related to the design and product development phase can be determined with greater accuracy by using the ABC system (Ben-Arieh & Qian, 2003, p: 171).

The primary focus of ABC is indirect costs, by using activities as a middle mean to allocate them to the product in a cause and effect way. Horvath (1993) states "As indirect costs become increasingly important, their management has to be included in the target costing process. Activity-based costing is an ideal instrument to meet this requirement. It can support target costing in determining the drifting cost, calculating the product costs under strategic considerations and in supporting the reduction of overhead costs" ABC can provide valuable support to target costing efforts. Product cost analysis is the process that estimates two things(Flesser & Fisher, 2000, p: 42):

- Cost of production of new product under existing process characteristics.
- Cost of implementation of new production process characteristics.

Smith, Lewis, & Churchwell (2002), and Maria (2012), also argue that ABC is useful while determining target cost and drifting current cost to the allowable cost. ABC is used to estimate accurately the cost that would be incurred if the product were manufactured and distributed using the firm's existing capabilities.

On the other hand, once the product target cost has been established and the product enters the manufacturing phase, the firm need to ensure that the target cost is being respected(Cokins, 2002, p: 10). At this level, ABC/M also can play a crucial role by providing the actual cost information in order to highlight if there are variations between target cost and actual cost, and at the same time try to reduce costs via the activity and cost driver analysis. Achieving cost reduction objectives requires information that identifies the causes of current cost and the potential impact of attacking these cost drivers (Institute of Management Accountants (IMA), 1998). ABC/M can also identify those activities that produce value-added and whose rationalization allows more efficient cost management (Maria, 2012).

ABC/M can show clearly how the product cost is composed, cost items like manufacturing overhead, distribution, marketing, support, and overall business overhead, and also provide information about activities and processes and cost drivers. This

information form together with a base for decision making and performance measurement, target costing can use this information to change the nature and amount of currently available resources.

B- Life cycle costing

In theory, there are different perspectives of the product life cycle, depending on the nature and position of the viewer of the life cycle (Emblemsvåg, 2003, p: 16 and Hansen & Mowen, 2006, pp: 501-503). The marketing viewpoint looks at the life cycle of a product from a sales perspective and divides the product life cycle into four stages: the introduction stage starts when the new product is first introduced in the market; then the growth stage when its sales begin growing increasingly; once the growth rate is becoming slow, then the product reaches its maturity stage; finally, in the decline stage, the product sales decrease and its market share is receding. While this perspective focuses on the revenue behavior of the product, another viewpoint of the life cycle underlines life cycle costs, which is the production perspective of the product life cycle. From the production point of view, the product life cycle stages are defined by the type of activities and processes executed from the research and development to manufacturing right up to the logistics. Both preceding perspectives are viewing the life cycle from inside the firm; the marketing manager uses his viewpoint of the life cycle to know what decisions to take to support product sales and market share, while the producer or the management accountant uses the production perspective to understand the cost of each life cycle stage, from the product conception to sale and post-sale services; with an internal focus on these costs. For the product consumer, there is another definition of the product life cycle; the consumer looks at the expanses caused by this product from its purchasing to operating, support, maintenance and disposal. Furthermore, in an expanded view of life cycle costs, the whole society view looks at the societal costs of the product like pollution and other negative externalities.

As this study is about strategic cost management, the focus will be on the cost viewpoints of the life cycle; by describing what the nature of life cycle costs is, how can they be analyzed and monitored? And how can it be integrated with ABC/M to form a strategic cost management system?

I- The Concept and Objectives of Life Cycle Costing

Managing the costs effectively requires a good understanding of these costs first. By focusing only on the manufacturing costs, the firm might not have a holistic view on costs; despite the fact that the bulk of costs appear only in the manufacturing stage, prior decisions about the conception and design of the product have decided the commitment of 80% to 90% of the total product costs (Berliner & Brimson, 1988, p: 140). Thus, cost management practice should highlight all the life cycle costs of a product.

Life cycle costs refer to all costs related to a product during all phases of its life. This includes costs from research and development, process design, fabrication, logistics and support, through its operation to the end of its useful life (Okano, 2001 and Woodward, 1997). Life cycle costs are cradle to grave costs (Barringer & Weber, 1996).

The product life cycle starts in the firm with the research and development activities and ends at its disposal by the final user. The life cycle cost of a product consists of the costs to the manufacturer, user, and society (Asiedu & Gu, 1998, p: 885). Figure 3.3 illustrate examples of these categories. For a strategic view on the costs, the company should focus on reducing the total cost of the whole life cycle.

In the 1960s, the US department of defence has tried to use a life cycle costing methodology in order to evaluate the long-term cost effects of a new weapon when making purchasing decisions (Okano, 2001, p: 317). However, most of the methodologies developed by the department of defence did not focus on the use of life cycle costing for a design, but it was only for procurement purposes(Asiedu & Gu, 1998, p: 884). Though all the long-term advantages of the use of life cycle costing, it was not widely adopted (Woodward, 1997, p: 335).

	Company cost	Users cost	Society cost
Design	Market Recognition Development		
Production	Materials Energy Facilities Wages, salaries Etc.		Waste Pollution Health Damages
Usage	Transportation Storage waste breakage Warranty Service	Transportation Storage Energy Materials Maintenance	Packaging Waste Pollution Health Damages
Disposal/ Recycling		Disposal Recycling Dues	Waste Disposal Pollution Health Damages

Figure 3. 5: Life-cycle stages and costs

(Asiedu & Gu, 1998, p: 886)

The firm should be able to understand the life cycle costs, comprehend all relationships of the product life cycle, and implement tools that lead to revenue enhancement and cost reduction. Life cycle costing (LCC) analysis is an economic evaluation method of alternatives that considers all relevant costs (and benefits) associated with each alternative activity or project over its life (Okano, 2001, p: 318). Life cycle costing LCC is a set of tools and techniques which intend to estimate the costs associated with each stage in the product life and try to reduce costs in a holistic way.

In addition to LCC, there are other approaches also applying the wider view of the product life cycle, such as total cost of ownership TCO and life cycle assessment LCA. TCO is a procurement tool and philosophy which seeks to understand the true cost of buying a particular good or service from a particular supplier (Ellram & Siferd, 1998, p: 55). TCO is used for the purpose of supplier selection and supplier evaluation (Bhutta & Huq, 2002). Another approach that has a life cycle perspective is LCA, however as Emblemsvåg (2001) argue, the focus of LCA is more on the environmental issues with less concern with the cost aspect (Emblemsvåg, 2001, p: 18). While Korpi and Ala-Risku (2008) suggest that LCC is the most relevant cost management method, as TCO neglects

operations and maintenance costs, and LCA promotes environmental impacts instead of being a costing tool (Korpi & Ala-Risku, 2008, p: 242).

The primary role of LCC is to support the profitability analysis of the product throughout its life by focusing on the planning stage; LCC provides information basis on which managers and planners can manage costs effectively since it shows cost behavior during each phase of the product life cycle. Emblemsvåg (2003) state three main purposes which LCC can serve: (1) LCC can be an effective engineering tool for providing decision support in the design and procurement of major open systems, infrastructure, and so on. (2) LCC overcomes many of the deficiencies of traditional cost accounting by giving the manager a holistic cost vision of the product. And (3) LCC can be a design and engineering tool for environmental purposes (Emblemsvåg, 2003, p: 23).

Moreover, Barringer and Weber (1996)argue that LCC can be used as a management decision tool for (Barringer & Weber, 1996, p: 08):

- **Costing discipline:** it is concerned with operating and support cost estimates.
- **Procurement technique:** it is used as a tool to determine cost per usage.
- **Acquisition tool:** it is concerned with balancing acquisition and ownership costs.
- **Design trade-off:** it integrates effects of availability, reliability, maintainability, capability, and system effectiveness into x-y charts that are understandable for cost-effective screening methods.

The central idea in LCC is the understanding of the cost items interaction that accumulates among the relevant stakeholders during the different life cycle stages. For example, the societal costs caused by environmental pollution can be reduced by-product development continually. However, the development actions will make the manufacturing costs higher because of the need for more expensive components and materials (Lindholm & Suomala, 2005, p: 282). Thus, the extensive and detailed implementation of life cycle costing provide a diversified analysis of cause and effect. However, it is possible to adopt a much simpler manner. The detailed surveillance of the acquisition and operational costs of a specific product from the company's point of view can by itself expose the true cost structure of a product and reveal several interesting cause-effect relations (Lindholm & Suomala, 2005, p: 283).

II- Dimensions of Life Cycle Costing

Lindholm and Suomala 2007 argue that there are two distinct dimensions of life cycle costing (A Lindholm & Suomala, 2007, p: 651):

- Estimating costs on a whole life cycle basis; and
- Monitoring the cost incurred throughout a product's life cycle.

1- Cost estimation on a whole life cycle basis:

The starting point in product life cycle cost estimation is to understand the product's life cycle and the activities that are performed during its phases. Life cycle costing is concerned with optimizing total costs in the long run, which requires considering trade-offs between different cost elements during the life phases of a product (Lindholm & Suomala, 2005, p: 283). Many studies (Ahmed, 1995; Asiedu & Gu, 1998; Emblemsvåg, 2003 and Lorino, 2003) state four main different ways of performing LCC exist: analogy, parametric, engineering cost methods, and cost accounting.

1-1- Analogy Model:

The life cycle costing model estimate made by an analogy identifies a similar product or component and adjusts its costs for differences between it and the target product. (Emblemsvåg, 2003, p: 36). The effectiveness of the analogy model relies heavily on the capability of a clear identification of the differences between the existing products and those deemed to be targeted (Lorino, 2003, p: 306). Under the analogy models, costs are handled entirely with nothing said about direct labor or overhead costs. It simply looks at what the costs have been historically and scales them according to the most important cost driver (Emblemsvåg, 2003, p: 36).

The main weakness of estimating by analogy is the high degree of judgment required. Expert judgment and complete familiarity with the product and processes are required to identify and deal with similarities and make adjustments for perceived differences. This approach though tends to be very good for new products (Asiedu & Gu, 1998, p: 893).

1-2- Parametric model:

Parametric models are in many ways more advanced analogy models. (Emblemsvåg, 2003, p: 37). Cost estimation with a parametric model is based on predicting a product's

or a component's cost either in total or for various activities, e.g. design or manufacture, by the use of regression analysis based on historical cost and technical information (Asiedu & Gu, 1998, p: 893).

When comparing the parametric models to the analogy models, three main differences can show up (Lorino, 2003, p: 306 and Emblemsvåg, 2003, p: 37). First, an analogy model depends on one single, dominant cost driver, whereas a parametric model can use several parameters. Second, an analogy model is based on linear relationships between costs and cost drivers, while parametric models rely on one or more nonlinear regression models. Third, whereas analogy models use an analogy (such as mass) as a driver, parametric models are essentially regression, or response surface, models that can be linear, quadratic, multidimensional, and so on (Emblemsvåg, 2003, p: 37).

Like the analogy models, parametric models do not handle overhead costs in a credible fashion, nor do they go beyond simply presenting an assessment number without any further insight, except what is a direct consequence of their parameters (Emblemsvåg, 2003, p: 37). Another limit of the parametric estimating is that it is not very good for estimating the cost of products that utilize new technologies (Asiedu & Gu, 1998, p: 893).

1-3- Detailed models:

Under the detailed model (also called the engineering cost model Emblemsvåg 2003, p: 38) the life cycle costs are estimated by focusing on the relative technical analysis of the product, estimates of labor time and rates and also material quantities and prices to estimate the direct costs of a product or activity (Asiedu & Gu, 1998, p: 894 and Lorino, 2003, p: 306)

It is the most time consuming and costly approach and requires a very detailed knowledge of the product and processes. However, the most accurate cost estimates can be made using this approach (Asiedu & Gu, 1998, p: 894 and Emblemsvåg, 2003 p: 38)

1-4- Cost Accounting Models:

According to Emblemsvåg 2003, cost accounting and cost management systems can be used to estimate life cycle costs. The traditional costing systems are volume-based, thus the cost information under these systems is distorted (as shown in section one in this chapter); the use of these systems to estimate life cycle costs can lead to poorly cost

estimation. Hence, activity-based costing can be used as an estimation method of the life cycle costs (Emblemsvåg, 2003 p: 39-41). A detailed model of LCC based on ABC analysis is discussed in the last element of this section.

As the cost estimates are decisions about what costs will be in the future, these estimates will be exposed to uncertainty, so in parallel with the use of the previous models to estimate life cycle costs, great importance should be given to risk assessment and probability analysis. Asiedu and Gu 1998 state that the achievement of an LCC analysis including uncertainty and dependencies could result in cost ineffectiveness, i.e. the savings from this will not be worth the effort to achieve it (Asiedu & Gu, 1998, p: 896).

2- Cost Monitoring throughout a product's life cycle:

In addition to the estimation of future costs, an essential feature of LCC is cost monitoring during a product's life cycle (Woodward, 1997, p 335). The aim is to monitor the actual costs against predicted life cycle costs and to determine the cumulative costs throughout a product's life cycle (Lindholm & Suomala, 2005, p: 284). In this matter, the focus in LCC changes during the product's life cycle, and try to understand how these changes can affect costs.

The aim focus in life cycle cost monitoring is how to drive down the total cost of the product life cycle, and how to enhance the profitability. Figure 3.4 illustrate the cost reduction opportunities during the life cycle phases. The most effective way for the life cycle cost reduction is to focus the efforts on the activities that occur before the manufacturing stage (Hansen & Mowen, 2006, p: 505).

Using LCC as a cost management technique can bring to good firm benefits. According to Cooper and Slagmulder (2004), the company can achieve significant savings during product life cycle even in an environment of products with short life cycles and aggressive cost management focused on product design (Cooper & Slagmulder, 2004, p: 45). LCC is actually more a way of thinking than merely a costing tool because, in addition to the management of costs, it focuses on the long-term performance of products by employing a variety of management accounting methods. A basic assumption providing motivation for the LCC approach is that it is usually possible to affect the future costs of a product beforehand, either by planning its use or by improving the product itself (Lindholm & Suomala, 2005, p: 283-284).

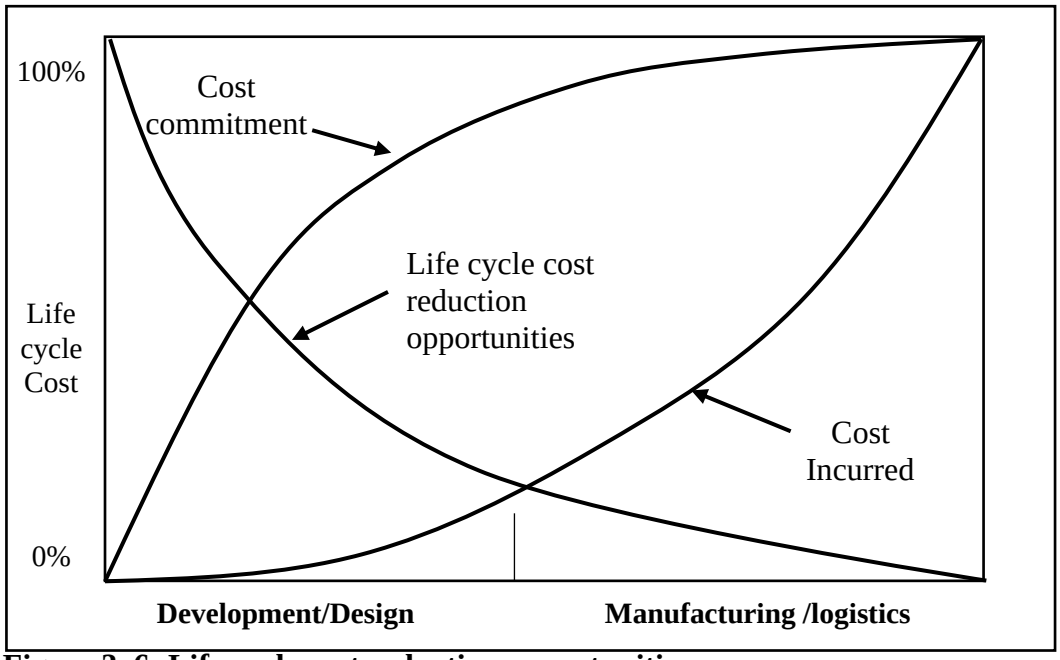

Figure 3. 6: Life cycle cost reduction opportunities

Adapted from (Barringer & Weber, 1996, p: 28)

III- **Integrating Life Cycle Costing and ABC/M:**

Life cycle costing is a total cost management approach that can lead to a holistic view of costs across all stages of the product life cycle. Kreuze and Newell (1994) argue that the combination of life cycle costing and ABC/M can allow for the development of better design methods, production methodologies, marketing strategies, and disposal options, through all phases of the life cycle (Kreuze & Newell, 1994, p: 39). Applying LCC in combination with ABC/M can provide two main advantages.

The first advantage of combining LCC with ABC/M relies on the use of ABC cost information in all phases of the life cycle. Cokins (2002) argue that some of the ABC data is useful during the design and development phases; and in the same time ABC cost data is applicable without question during the mature phase of the product's life cycle, where the work is recurring (Cokins, 2002, p: 16). The accuracy of cost information under an ABC system about activities and cost drivers can be used as basic data while designing new products.

The second feature of using LCC combined ABC/M is the application of ABC principles when estimating the life cycle costs. The main principle of ABC is that product consume activities and the way of performing those activities define how much resources are needed. Applying this principle in the costing of life cycle activities provide a LCC

based on activities. This model is called activity-based life cycle costing ABLCC. (Emblemsvåg, 2001, Kumaran, Ong, Nee, & Tan, 2002, Emblemsvåg, 2003 and Rivero & Emblemsvåg, 2007) argue that ABLCC is an effective tool for analyzing life cycle costs, Its contributions are many in that it (Rivero & Emblemsvåg, 2007, p: 371):

- Handles both costs and cash flows.
- Is process-oriented.
- Relies upon the establishment of cause and effect relationships.
- Handles overhead costs.
- Estimate the costs of all cost objects of a business unit simultaneously.
- Handles uncertainty and huge models in a realistic fashion.

Combining ABC/M and LCC provide the managers with useful information about activity cost and new product costs.

C- The relationship between ABC/M and BSC

As mentioned in the previous chapter, the Balanced Scorecard BSC is a set of financial and non-financial performance measures arranged in four perspectives and linked to the organizations vision and strategy. On the other hand, activity-based costing and management system provides more accurate cost information and displays the organization in the form of linked --value-added or non-value-added -- activities and processes. Either BSC or ABC/M, if used effectively, the organization can benefit from enhanced cost and performance management with a linkage with the strategy. According to many writers, ABC/M and BSC can be integrated and liked together to bring more insights to performance management and strategic orientation (Kaplan & Norton, 1996b,and 2001c; Adkins, 2006; Egbunike, Blessing, & Chigozie, 2015; Wu & Chen, 2012; There & There, 2007; Cardoş & Cardoş, 2014; Taleghani, 2017).

ABC/M can be linked to the BSC perspectives by contributing to the development of performance measures that include costs, profitability and activity drivers. Figure 3.8 present a conceptual model that combines BSC and ABC/M.

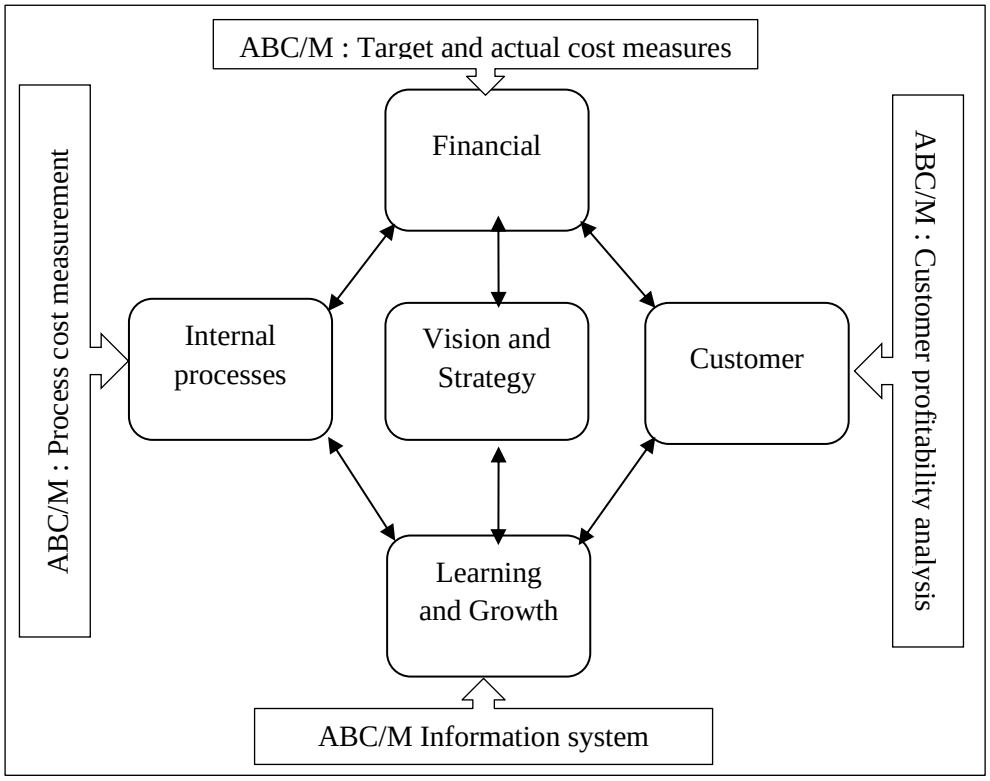

Figure 3. 7 : The Linkages between ABC/M and BSC

From Figure 3.8, it can be seen that ABC/M might be connected with the four perspectives of the BSC.

I- ABC/M and the Financial Perspective

As we see in chapter two, the objectives in this perspective are revenue improvement and cost reduction or productivity enhancement through reducing operating expenses and unit costs. According to Kaplan and Norton, revenue growth can be achieved by raising the prices on products, services and customers if costs in these areas are not covered; the problem, in this case, is with the accurate calculation of these costs and revenues. Thus, using an activity-based cost system make it easier to trace resources consumption through activities to final products, services and customers (Kaplan & Norton, 1996b, p: 55).

Cost reduction and productivity improvement also is a cornerstone for the financial perspective; in this matter, the organization that uses ABC/M has the possibility to better understand its cost behavior and structure, and define which activities are non-value-added which make it easier to reduce costs without affecting the value expected by customers.

From another point of view, the use of ABC/M leads to better fixing of cost objectives and target values through the use of the activity-based budgeting ABB process.

Kaplan and Norton state that merging information on the predicted volume and mix of products and services with projected activity and process efficiencies to build a bottom-up budget for coming periods (Kaplan & Norton, 2001c, p: 157).

II- ABC/M and the Customer Perspective

One of the main customer performance measures in the balanced scorecard is customer profitability, any organization prefers to have profitable customers. In this matter, activity-based cost systems which trace costs to different cost objects (Products, services and Customers) can measure the cost accurately to serve each customer. Kaplan and Norton state that "Using activity-based costing to measure profitability at the individual customer level, they measured their success in reducing the percentage of unprofitable customers" (Kaplan & Norton, 2004b, p: 120).

According to Kaplan and Cooper, an ABCM model allows the accurate calculation of resources consumed by customers and distribution and delivery channels; thus, the manager has better opportunities for the customers' profitability improvement, include (Kaplan & Cooper, 1998, p: 181):

- "Protecting existing highly profitable customers;
- Repricing expensive services, based on cost-to-serve;
- Discounting, if necessary, to gain business with low cost-to-serve customers;
- Negotiating win-win relationships that lower cost-to-serve with cooperative customers;
- Conceding permanent loss customers to competitors; and
- Attempting to capture high-profit customers from competitors."

Customer profitability analysis is considered one of the main features of using activity-based costing and management, the information that this analysis produce represents valuable data for the development of measures from the customer perspective.

III- ABC/M and the Internal Processes Perspective

The new paradigm in management accounting works well with the horizontal view of the organization; with the appearance of the value chain concept, many tools of management accounting used this analysis such as ABCM. By nature, an activity cost system trace costs of resources to activities in the first stage of cost assignment process; with this practice, the manager can easily understand why and how costs have occurred in each activity. Chenhall argues that ABCM has developed from just a costing technique to a management philosophy with a focus on categorizing value-adding activities and removing non-value-adding activities (Chenhall, 2009, p: 1213).

The internal processes perspective aims to display the performance metrics relied on the organization's operations and processes, showing how excelling in these processes can lead to good customer satisfaction. Process cost is one of the measures in this perspective, along with time and quality; yet, process cost should be measured correctly. Traditional costing methods failed to measure costs at the process level because they generally deal with the hierarchic responsibility centers, without regard to the links between activities among different centers.

Kaplan and Norton state that "Only an ABC model can accurately trace organizational expenses to procurement, manufacturing, distribution, or delivery process. So a properly constructed ABC model is central to measuring costs in the BSC's internal perspective" (Kaplan & Norton, 2004b, p: 96).

ABCM process cost analysis identifies cost and its driver in each activity and process, which can provide in addition to quality and time measures three main indicators to describe important internal business processes.

IV- ABC/M and the Learning and Growth Perspective

The learning and growth perspective focus on the intangible assets of the organization, which can be illustrated in three main aspects: human capital, organizational capital and the information capital. The information capital means all the knowledge of employees about customers, internal processes and also new techniques of management excellence.

Learning about activity-based costing and management along with other techniques such as six sigma and just-in-time management gives the employees more ability and

knowledge to continuous cost reduction and quality improvements (Kaplan & Norton, 2004b, p: 312).

ABCM offers valuable information about costs of products, services and customers and other cost objects, this can help the organization enrich the financial perspective of the BSC by powerful measures, and at the same time, it provides up to date data about actual costs, which allow comparing to targets and objectives. Another utility of using ABCM is the customer profitability measurement that categorizes the organization's customers in guide of their margins and 'costs to serve', this aspect supports the customer perspective in the BSC by offering information about measures used in this perspective. Also, through its horizontal view of the organization, ABCM is a good source of activity and process costs which supports the internal processes perspective. Finally, ABCM as an information system and innovation in the field of management accounting, is considered as important knowledge for employees to acquire for more performance improvement.

Section Three: The Strategic decisions making

A strategic decision is generally a trade-off between at least two strategic alternatives, it deals with the long term direction of the organization. Strategic decision making is

considered one of the main concerns of the strategic management process because it plays a vital role in achieving strategic objectives and gaining competitive advantages. In this section, strategic decision making will be discussed by addressing the concept of the strategic decision, its characteristics and its categories, then we talk about the strategic decision-making process.

A- The Strategic Decision Concept

The strategic decision is one of the important actions in the strategy formulation process, it is based on the results of the strategic analysis phase carried out by the organization, which forms a set of available alternatives and the strategic decision is the best choice from the management's point of view. The concept of strategic decision has attracted the attention of many writers and researchers in the strategic management literature. The strategic decision can be defined as:

According to Srinivasan, the strategic decision is a long-term process where the planned objectives lead the current and potential resources deployment (Srinivasan, 2014, p: 246). This definition focus on the long-term direction of the strategic decision. From another point of view, strategic decisions are decisions made in senior management and cover the organization as a whole (Gänswein, 2011, p: 12). Wilson defines strategic decisions as "the category of decisions that drive or outline most of an organization's actions, are not easily changed once made, and have the greatest impact upon organizational performance" (Wilson, 2005, p: 318). Strategic decisions affect the future of the organization and its relationship with its environment, Hickson et al. argue that "unlike many other decisions, strategic decisions deal with the long-run future of an entire organization and have three characteristics:

- **Rare**: Strategic decisions are unusual and typically have no precedent to follow.
- **Consequential**: Strategic decisions commit substantial resources and demand a great deal of commitment from people at all levels.
- **Directive**: Strategic decisions set precedents for lesser decisions and future actions throughout an organization." (Hickson et al., 1986 **IN** Wheelen & Hunger, 2012, p: 25)

The strategic decision is the essence of the administrative process and its basic tool to achieve the objectives of the organization; it is one of the topics that have an effective impact on the work of organizations. The great and rising importance of strategic decisions is due to the fact that they (Papadakis & Barwise, 1997, p: 01):

- "Are usually big, risky, and hard-to reverse, with significant long-term effects;
- Are the bridge between deliberate and emergent strategy;
- Can be a major source of organizational learning;
- Play an important role in the development of individual managers, and;
- Cut across functions and academic disciplines".

B- The Strategic Decision-Making Process

Strategic decision-making process has aroused the interest of many researchers, Blocher et al. give five main steps that strategic decision-making should follow (Blocher et al., 2010, p: 8-19):

1) Determine the strategic issues surrounding the problem;
2) Identify the alternative actions;
3) Obtain information and conduct analyses of the alternatives;
4) Based on strategy and analysis, choose and implement the desired alternative;
5) Provide an ongoing evaluation of the effectiveness of implementation in step 4.

According to Harrison and Pelletier, the managerial attitudes to the decision-making process are affected by two main factors (Harrison & Pelletier, 1993, p: 247):

- The attainability of the managerial objectives that undergird the process and
- The openness of the process to the external environment and to the numerous constraints that tend to limit the alternatives of the managerial decision-makers.

The components of the managerial decision-making process are the functions of managerial decision making. These functions are as follows (Harrison & Pelletier, 1993, p: 247):

1. **Setting managerial objectives:**

Objectives initiate the process of decision making; and a given cycle within the process culminates upon reaching the objectives that gave rise to it. Subsequent cycles begin with the setting of new objectives.

2. **Search for alternatives:**

   The search involves scanning the internal and external environments of the organization for information. Relevant information is formulated into alternatives that seem likely to attain the objectives.

3. **Comparing and evaluating alternatives:**

   Alternatives represent various courses of action likely to achieve the objectives. Alternatives are compared and evaluated to ascertain their relative desirability as choices by management.

4. **The act of choice:**

   The choice is a moment in the ongoing process of decision making when the managers choose the alternative (or those alternatives) most likely to satisfy the most significant aspects of the objectives.

5. **Implementing the decision:**

   Implementation is the point in the overall decision-making process when the choice is transformed from a desirable alternative into an operational reality throughout the organization.

6. **Follow-up and control:**

   This function involves measurement and evaluation of the operational results to ensure an outcome consistent with the managerial objectives that initiated the overall process.

Strategic decision-making is only one step in the decision-making process. The strategic decision does not appear suddenly; it is preceded by several steps and followed by other ones. The aim here is not to discuss them in detail in the light of different views and approaches that differ in their interpretation of the decision-making process and the way it is taken. But what is more important in this research is to address the forms and types of strategic decisions to look later for the relationship between strategic decisions and BSC and ABCM.

C- Strategic Decisions Types

Strategic Decisions, according to Kaplan and Cooper (1998), are those decisions about four main areas: Product mix and pricing, Customer relationships, Supplier selection and relationships and Product design and development. While Alexander (1985) and Al-Ghamdi (1998) give more details by classing strategic decisions in six categories as follow: Introduce a new product or service, Open and start up a new plant or facility, Expand operations to enter a new market, Discontinue a product or withdraw from a market, Acquire or merge with another company, Change the strategy in an operational department and Others. In this study, the researcher has merged both those two perspectives of the writers above and propose to measure strategic decisions making SDM using these elements:

1) Decisions about: Product mix and pricing
    - Introduce a new product or service
    - Discontinue a product or withdraw from a market
    - Repricing existing products or services
2) Decisions about: Customer relationships
    - Open and start up a new plant or facility
    - Expand operations to enter a new market
3) Decisions about: Supplier selection and relationships
    - Supplier selection
    - Supplier Abandoning
4) Decisions about: Product design and development
    - Redesign products
    - Improve production processes
    - Invest in flexible technology
5) Other strategic decisions
    - Acquire or merge with another company
    - Change the strategy in an operational department

Chapter Four: The empirical Study -a survey-

Chapter Four: An empirical study on the impact of using ABC/M combined with BSC on strategic decisions effectiveness: A Survey on a sample of Algerian companies

The object of this study is to explain and answer the main research questions: Is there an impact from using activity-based costing/management combined with balanced scorecard on strategic decisions making improvements?

From the literature, both activity-based costing/management and the balanced scorecard have proven their usefulness systems to serve the management need of accurate and timely information about all the axes of the organization performance. The management also needs a solid information basis in order to make effective decisions; strategic decisions are the most important type of decisions given to their significant impact on the organization sustainability and long-term objectives.

As discussed in the previous chapters, activity-based costing and management ABCM when combined with the balanced scorecard BSC can offer more visibility to formulate, implement and control the strategy of the organization, and to make more effective strategic decisions.

In this chapter, the researcher will try to examine if there is a significant impact from using activity-based costing/management and the balanced scorecard on strategic decisions making in the Algerian context. To do so, this chapter is divided into three main sections as follow:

- The Conceptual Framework and the Research Methodology;
- The Descriptive Statistics of the Study; and:
- The Regression Analysis and Hypotheses Testing.

Section One: The Conceptual Framework and the Research Methodology

A- The Conceptual Framework

The aim objective of this study is to define if there is an impact of using Activity-based Costing and Management ABC/M system combined with the Balanced Scorecard BSC on Strategic Decisions Making SDM. The model presented in Figure 4.1 shows the relationship between the combined use of ABC/M and BSC and its impact on SDM.

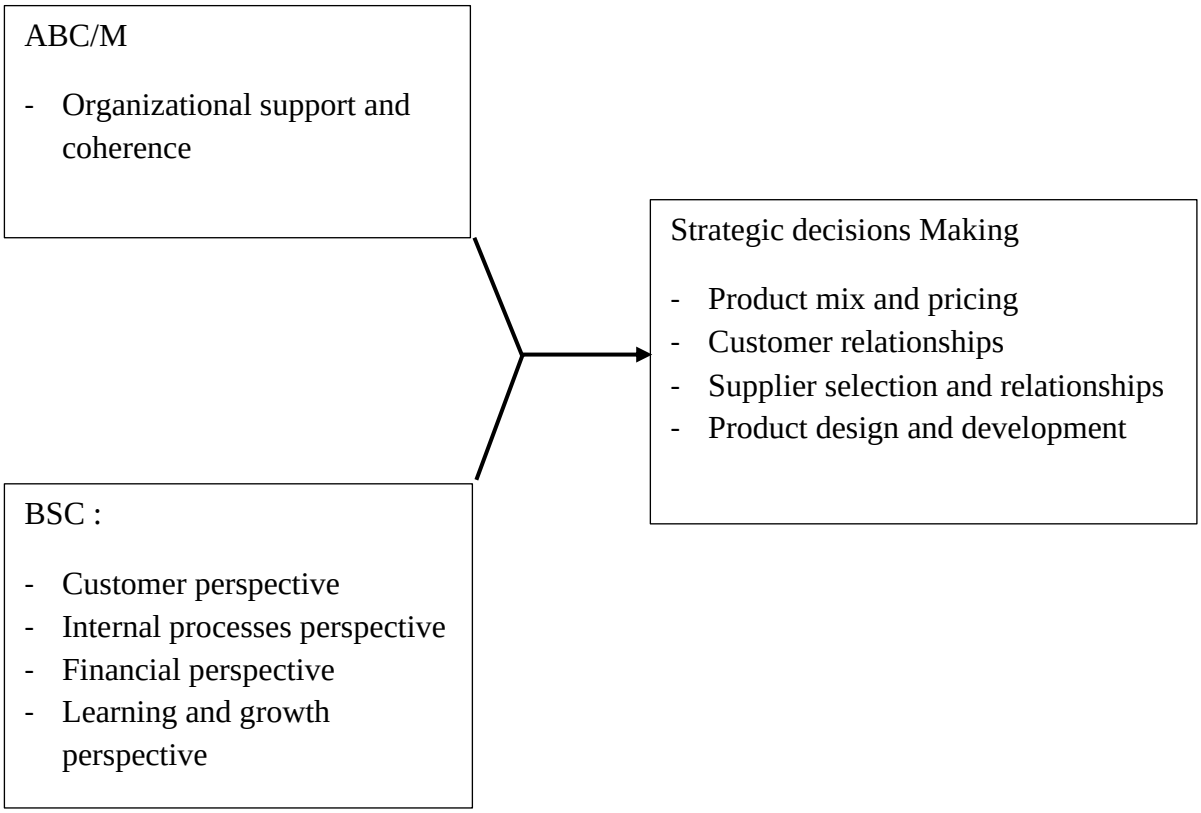

Figure 4. 1 : Theoretical Framework of the study

It has been discussed in the previous chapters that ABC/M is an effective system that allows the organization to get more accurate cost information, to understand better its cost structure and behavior and gives it more opportunities for cost reduction and management. It was proven that the use of this system could enhance the ability of managers to make better decisions in both operational and strategic views. On the other hand, the use of the BSC as performance measurement and a strategic system can also provide a balanced view on the organization performance by merging both financial and non-financial measures from four perspectives. In this study, both ABC/M and

BSC are independent variables; Strategic Decisions Making SDM is the dependent variable.

I- Variables measurement:

Here, the researcher is going to present how all the study variables are measured, by relying on previous studies in the field.

1- Independent variables:

- **Activity-based Costing and Management ABCM:** how to measure ABC/M success? the researcher has used the basic framework of Shields (1995), and that of Maiga and Jacobs (2003), they suggested that an ABC/M success can be measured by the organizational support and coherence given to the ABC/M system from top management of the organization. Organizational support and coherence of the ABC/M system according to Shields (1995), and that of Maiga and Jacobs (2003) can be seen and measured by six main elements as follow (Shieds, 1995 and Maiga & Jacobs, 2003):
    1) Management support
    2) Consensus on objectives
    3) Competitive strategy link
    4) Linkage to quality initiative
    5) Non-accounting ownership
    6) Performance evaluation/ compensation

  These variables were put to respondents utilizing a five-point Likert scale, running from one (strongly disagree) to five (strongly agree), the respondents have to answer the question "In your opinion, your firm has succeeded in the implementation of ABC/M"

- **The Balanced Scorecard BSC:** the BSC variable was measured using the four perspectives which Kaplan and Norton (1992; 1996) proposed. Those perspectives according to Hoque, Mia, & ALam (2001)in their study, can be measured by twenty indicators (measure), Maiga and Jacobs (2003) also used these items in their study. These twenty indicators are:
-

- **Customer perspective: eight measures**

1) Customer response time,
2) Survey of customer satisfaction,
3) Number of customer complaints,
4) On-time delivery,
5) Cycle time from order to delivery,
6) Per cent shipments returned due to poor quality,
7) Warranty repair cost
8) Market share

- **Internal process perspective: six measures**

9) Manufacturing lead time,
10) Ratio of good output to total output,
11) Labor efficiency variance,
12) Material efficiency variance,
13) Rate of material scrap rate,
14) Per cent defective products shipped

- **Learning and growth perspective: three measures**

15) Number of new patents,
16) Time to market a new product,
17) Number of new product launches

- **Financial perspective: three measures**

18) Return on investment,
19) Operating income,
20) Sales growth.

The respondents were requested to indicate on a five-point Likert scale, starting from one (Never) to five (Frequently), as an answer to the question "In your opinion, your firm has succeeded in the implementation of BSC Because of the amount of use of these indicators". The implementation success of the BSC is due to the use of these indicators in each perspective of the BSC.

2- Dependent variables: Strategic decisions Making

Strategic Decisions are, according to Kaplan and Cooper (1998) decisions about four main areas: Product mix and pricing , Customer relationships, Supplier selection and relationships and Product design and development. While Alexander (1985) and Al-Ghamdi (1998) give more details by classing strategic decisions in six categories as follow : Introduce a new product or service, Open and start up a new plant or facility, Expand operations to enter a new market, Discontinue a product or withdraw from a market, Acquire or merge with another company, Change the strategy in an operational department and Others. In this study, the researcher has merged both those two perspectives of the writers above and propose to measure strategic decisions making SDM using these elements:

1) Decisions about: Product mix and pricing
   - Introduce a new product or service
   - Discontinue a product or withdraw from a market
   - Repricing existing products or services
2) Decisions about: Customer relationships
   - Open and start up a new plant or facility
   - Expand operations to enter a new market
3) Decisions about: Supplier selection and relationships
   - Supplier selection
   - Supplier Abandoning
4) Decisions about: Product design and development
   - Redesign products
   - Improve production processes
   - Invest in flexible technology
5) Other strategic decisions
   - Acquire or merge with another company
   - Change the strategy in an operational department

On a five-point Likert scale, the respondents are asked to choose from one (Strongly disagree) to five (strongly agree), as an answer for the question "In your opinion, your firm has made the strategic decisions stated below effectively".

After discussing how research variables are going to be measured, now we recall the hypotheses of this study. The hypotheses of this study were stated as follow. The main hypothesis is

H0: There is a positive impact of using activity-based costing and management ABC/M combined with Balanced Scorecard BSC on Strategic Decisions Making.

From this hypothesis, we can develop other sub-hypotheses:

H11: There is a positive impact of using activity-based costing and management ABC/M combined with the financial and customer perspectives on decisions about product mix and pricing.

H12: There is a positive impact of using activity-based costing and management ABC/M combined with the financial and customer perspectives on decisions customer relationships.

H13: There is a positive impact of using activity-based costing and management ABC/M combined with the internal processes and learning-growth perspectives on decisions about supplier selection and relationships.

H14: There is a positive impact of using activity-based costing and management ABC/M combined with the internal processes and learning-growth perspectives on decisions about Product design and development.

B- The Research Methodology

The object of this study is to explain and answer the research questions: Is there an impact from using activity-based costing/management combined with balanced scorecard on strategic decisions making improvements? Is there an impact between activity-based costing and management combined with the financial and customer perspectives on decisions about product mix and pricing and customer relationships? Is there an impact between activity-based costing and management combined with the internal processes and the learning-growth perspectives on decisions about Supplier selection and relationships and Product design and development? In order to answer these questions, this study is conducted across a number of industry sectors in Algeria.

According to Smith, many research methods can be used to conduct an empirical study in accounting such as survey research, experimental research and archival research (M. Smith, 2003). To achieve this goal, a survey questionnaire is designed to analyze the research variables and test the study hypotheses, as we will discuss later in this chapter. A survey approach is a method to collect data for explaining, comparing and describing attitudes, behavior and science in general. Surveys are viewed as a suitable technique for collecting data and testing hypotheses. Many writers in the management accounting area used this method of analysis (Abernethy & Brownell, 1999 and Maiga & Jacobs, 2003). Maiga and Jacobs (2003) measured the combined effects of BSC and ABC on organizational performance, by using a mail-out survey in collecting information since it was a practical technique and appropriate for examining the extensive sample of firms in their research.

The selection of a proper research methodology is an important phase in defining the steps to be followed towards the achievement of the study. It offers all the necessary stages to be followed in collecting and analyzing the research data. This study is based on quantitative research by conducting a questionnaire survey of all industry sectors in Algeria.

To test and validate the research hypotheses using the appropriate analytical methods and to arrive at conclusions and recommendations that contribute to the objectives of this study. The researcher relied on two main sources of data collection: the first category is the secondary sources: which provides the researcher with indirect data on the subject. These sources were the scientific production of books, articles, periodicals and previous studies that dealt with the subject of the current study, in order to provide adequate coverage of the framework of the study. The second category is the primary Sources: which are based on the survey questionnaire as the main tool for the field study, which was designed specifically for this purpose and distributed to the target group.

The main reason for using survey research in this study is to answer the research questions and test research hypotheses. Further, the survey method is conducted to examine the impact of the linkage between ABC/M and BSC on Strategic decisions.

C- The Survey Sample

Once the researcher has identified the problem of the study and its hypotheses, and after defining the study tool and collecting the data, the study population must be identified. If the researcher can study all the members of the study population, his study will have more

accurate and precise results. However, it may be difficult to deal with all members of the study population for several reasons, in this case, the researcher might conduct the study only on a subset of the study population. This group is called the study sample.

The study population is a term that is meant to be used to disseminate the results of the study; it defines all the elements of the studied phenomenon. In this study, the population is the group of accountants, management controllers (contrôleurs de Gestion) and executive managers of firms working in Algeria. The target study population consists of firms **registered** in the Algerian Business Directory (Annuaire des Entreprises Algériennes) from the official website of the Algerian Chamber of Commerce and Industry (http://elmouchir.caci.dz), the number of these firms is 26744 firms from different sizes and various industry sectors as shown in Table 4.1.

Business Sectors	**N**
Building, public works and hydraulics	2833
Textile, Clothing and Leather Products	216
Studies, engineering and financial services	2934
Mining, energy and related activities	159
Paper, cardboard and publishing	928
Plastic, chemistry, rubber and glass	2218
Industry Service Provision	2134
Food and Beverage products	1905
Iron, steel and Metals products, mechanics, electricity and electronics	6781
Textile and clothing	464
Wood Product Manufacturing	1317
Tourism-transit-hotel transport	1977
Service activities and other institutions	2878
Total	**26744**

Table 4. 1 : The Study Population Firms

Source : (Annuaire des entreprises Algériennes, https://elmouchir.caci.dz/ **date** Fed 19, 2017.)

From this population of firms, a random sample has been selected to be the target of the research questionnaire survey. Choosing a sample for the study means that the researcher cannot carry out a comprehensive study of the entire population of the study. After defining the characteristics of the society, the researcher chose an appropriate sample in order to conduct the study. The sample is a partial group of the population, it should represent the population so that the results of this sample can be generalized to the entire population, since the sample of the study must retain all the characteristics of the original society so that its representative is, because the sample of the study must retain all the characteristics of the original society to represent it in a meaningful and expressive manner.

The choice of the sample accurately and appropriately gives results very similar to the results that can be obtained when studying the whole study population, and the larger the size of the sample the larger the representation of the characteristics of the study community, and thus can be generalized results reached the original study population. Therefore, the sample of the study is a means to facilitate the work of the researcher and provide more accurate results. Consequently, the sample size is the most important element in the sample of the study because it affects the results and accuracy of the study. In this study, the researcher uses Krejcie and Morgan method to define the sample. According to Krejcie and Morgan, the sample can be constructed using the following formula (Krejcie & Morgan, 1970, p: 607).

$$s = \frac{\chi 2 \mathrm{NP}(1-\mathrm{P})}{[d^2(\mathrm{N}-1) + \mathrm{P}\chi 2(1-\mathrm{P})]}$$

While:

- s = required sample size.
- X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).
- N = the population size.
- P = the population proportion (assumed to be 0.50 since this would provide the maximum sample size).
- d = the degree of accuracy expressed as a proportion (0.05).

Using the formula above, and from the website (http://www.raosoft.com/samplesize.html), we find that the sample size is 379, as shown in Appendix (03). The distribution of this sample on the industry sectors of the population firms can be made on a proportionately way as shown in Table 4.2.

Business Sectors	Population	Sample
Building, public works and hydraulics	2833	40
Textile, Clothing and Leather Products	216	3
Studies, engineering and financial services	2934	42
Mining, energy and related activities	159	2
Paper, cardboard and publishing	928	13
Plastic, chemistry, rubber and glass	2218	31
Industry Service Provision	2134	30
Food and Beverage products	1905	27
Iron, steel and Metals products, mechanics, electricity and electronics	6781	96
Textile and clothing	464	7
Wood Product Manufacturing	1317	17
Tourism-transit-hotel transport	1977	30
Service activities and other institutions	2878	41
Total	**26744**	**379**

Table 4. 2 : The sample size by industry sectors of the population firms

D- The study questionnaire

A questionnaire is a preformulated written set of questions to which respondents record their answers, usually within rather closely defined alternatives (Sekaran & Bougie, 2016, p: 142). After discussing the theoretical framework of the study, and defining how to measure every single variable, the researcher performed a questionnaire that contains five sections of data required to be collected from the sample chosen (as shown in Appendix 01).

The first section is about the general information of the firm, such as the organization type, the firm size, the number of employees, products or services does the firm offer for sale and the industry sector of the firm.

The second section contains questions and paragraphs that concern Activity-based Costing and Management ABC/M, starting with a brief definition of ABC and ABM. Then, the respondent is asked if the firm uses an Activity-based Costing and Management system, and if yes, for how long. As discussed before in this chapter, ABC/M success can be measured by six main elements (management support, consensus on objectives, competitive strategy link, linkage to quality initiative, non-accounting ownership and performance evaluation/ compensation); in this matter each one of these elements has been presented in two paragraphs. The respondent should answer on a five-point Likert scale ranging from one (Strongly disagree) to five (Strongly agree).

The third section contains questions and paragraphs that concern the Balanced Scorecard BSC, by presenting first a short definition. After that, the respondent is asked to answer if the firm uses BSC or not. Then, the respondent has to give his opinion on five-points Likert scale ranging from one (Never) to five (Frequently) about the use of the indicators of performance in each perspective.

The dependent variable Strategic Decisions Making SDM is addressed in the fourth section of the questionnaire. The respondent should give his opinion about the effectiveness of the firm in making strategic decisions on a five-point Likert scale ranging from one (Strongly disagree) to five (Strongly agree). In the last section, some demographic information is requested from the respondent, such as: the job title, the experience in the job and the level of education. Finally, the respondent is called to include the e-mail to send a request to the researcher e-mail if he/she would you like to get a summary of the findings of this research.

In the questionnaire, the researcher adopted the closed type of questions, which required the respondents to determine their response to a set of terms included in the questionnaire's axes to measure their trends towards the study variables. The five-point Likert scale was used to measure the degree of use of the study elements; the five-point scale is shown in table 4.3:

The scale	1	2	3	4	5
ABC and SDM	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
BSC	Never	Very Rarely	sometimes	Occasionally	Frequently

Table 4. 3 : The five-points Likert scale used in the study

From this scale, we can extract the range in the following way:

- Range = 5 – 1 = 4
- Scale length = 4 ÷ 5 = 0.8 which represent the length of each scale.

Table 4.4 shows the length of each scale:

1 – 1.8	1.8 – 2.6	2.6 – 3.4	3.4 – 4.2	4.2 - 5
Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Never	Very Rarely	sometimes	Occasionally	Frequently

Table 4. 4 : the scale used in Quantification of the sentences

The questionnaire was delivered to the sample members either hand to hand or by sending a request e-mail that contains a link to an online form of the questionnaire via Google Forms.

E- Validity and Reliability (Internal Consistency) of the Questionnaire

The questionnaire is valid when its questions allow measuring what has been set for measurement. Consistency is an important feature to be taken into account in designing the questionnaire. After designing the questionnaire, it must be tested for its validity and reliability. Validity is about the degree to which the questionnaire meets the objectives set for its measurement.

I- The External Validity (experts review):

The questionnaire was presented in its preliminary form to a group of arbitrators which are eleven (11) specialized professors in economic, business and management sciences, they are specialists in accounting, econometrics and statistical studies. These arbitrators were asked to express an opinion on the formulation and clarity of the questionnaire items, their appropriateness for the axis they belong to and

their effectiveness in testing the study hypotheses, they were also asked to propose what they judge as necessary modifications or eliminations is these items does not fit in with the axis they belong to. The arbitrator also can suggest adding some items or questions they see more suitable to the axis to which they belong and to the hypotheses testing, so that questionnaire becomes clearer and more comprehensive. The views of the arbitrators have been met with the necessary deletion and modification in light of the proposals made.

After adjusting the questionnaire according to the instructions of the arbitrators and verifying the veracity of the study tool, we conducted an exploratory testing study, which is a complementary part of the questionnaire process in its final form. It is mainly intended to evaluate the questionnaire and increase its performance by testing it in the field. The Pearson's correlation coefficient is calculated between each item and the axis it belongs. Also, The Cronbach's Alpha coefficient is also used to test the reliability of the questionnaire.

Before discussing the questionnaire internal consistency, we proceed first to the coding of its data and items. Table 4.5 present the codes used for each item of the variables (Dependent or Independent) and for each axis of these variables.

Variables	Sub-Variables	Code	The Item/question
Activity-based Costing and Management ABC/M	xv1	Q11	ABC/M initiative has a strong top management support.
		Q12	Top management has provided enough resources to the implementation of ABC/M system.
		Q13	There is a consensus about and clarity of the objectives of ABC/M system.
		Q14	ABC/M system designers and users are agreed that the information is produced efficiently and is effectively used.
		Q15	ABC/M system is effectively linked to the competitive strategy.
		Q16	The competitive strategy designers use the information of ABC/M system.
		Q17	ABC/M system is closely tied to the quality initiatives.
		Q18	Initiatives like Total Quality Management, ISO, Quality Cost Analysis, are made in light of ABC/M system.
		Q19	The use of ABC/M system is totally reserved for the accounting employees.
		Q20	Non-accounting employees (Engineering, Marketing, Production…) are committed to the use of ABC/M information.
		Q21	ABC/M system is used for performance evaluation/ compensation.
		Q22	ABC/M information is used to evaluate the performance of the employees, and to motivate and reward them.
Balanced Scorecard BSC	CUSTOMER PERSPECTIVE xv3	Q28	Customer response time
		Q29	Survey of customer satisfaction
		Q30	Number of customer complaints
		Q31	On-time delivery
		Q32	Cycle time from order to delivery
		Q33	Per cent shipments returned due to poor quality
		Q34	Warranty repair cost
		Q35	Market share
	INTERNAL PROCESSES xv4	Q37	Manufacturing lead time
		Q38	Ratio of good output to total output
		Q39	Labor efficiency variance
		Q40	Material efficiency variance
		Q41	Rate of material scrap rate
		Q42	Percent defective products shipped
	LEARNING AND GROWTH xv5	Q44	Number of new patents
		Q45	Time to market new product
		Q46	Number of new product launches
	FINANCIAL xv2	Q48	Return on investment
		Q49	Operating income
		Q50	Sales growth

Variables	Sub-Variables	Code	The Item / question
STRATEGIC DECISIONS MAKING SDM	Product mix and pricing yv1	Q53	Introduce a new product or service
		Q54	Discontinue a product or withdraw from a market
		Q55	Repricing existing products or services
	Customer Relationships yv2	Q57	Open and start up a new plant or facility
		Q58	Expand operations to enter a new market
	Supplier selection and relationships yv4	Q60	Supplier selection
		Q61	Supplier Abandoning
	Product design and development yv3	Q63	Redesign products
		Q64	Improve production processes
		Q65	Invest in flexible technology
	Other strategic decisions yv5	Q67	Acquire or merge with another company
		Q68	Change the strategy in an operational department

Table 4. 5 : The Questionnaire Data Coding

I- The Internal Validity and Reliability (Internal Consistency)

To ensure an extreme consistency, we try to answer the question: does the questionnaire measure the object of this study in an appropriate manner? This means to check the reliability and the validity of the questionnaire. The reliability is the extent to which each item in the questionnaire is related to the axis that this item belongs. The internal consistency of the questionnaire was measured by calculating the Pearson's correlation coefficients between each term(question) and the axis it belongs, and by calculating the Pearson's correlation coefficients between the sub-variables (the four perspectives in BSC and decisions categories in SDM) and the variables (BSC and SDM). Table 4.6 present the calculated Pearson's correlation coefficients.

From Table 4.6, we can note:

- The correlation coefficients between the score of each item in ABCM and the total score of ABCM (xv1) ranged between (0.715) and (0.910) which are statistically significant coefficients at the level of (0.01) and (0.05).
- The correlation coefficients between the score of each item in the customer perspective and the total score of this perspective (xv3) ranged between (0.422) and (0.731) which are statistically significant coefficients at the level of (0.01) and (0.05).

Variables	Pearson's	Sub-Variables	Pearson's	Code
Activity-based Costing and Management ABC/M	ABCM		0,857**	Q11
			0,809**	Q12
			0,813**	Q13
			0,792**	Q14
			0,877**	Q15
			0,899**	Q16
			0,884**	Q17
			0,794**	Q18
			0,715**	Q19
			0,911**	Q20
			0,831**	Q21
			0,847**	Q22
Balanced Scorecard BSC	0,935**	CUSTOMER PERSPECTIVE **CP**	0,748**	Q28
			0,686**	Q29
			0,745**	Q30
			0,737**	Q31
			0,732**	Q32
			0,574**	Q33
			0,422**	Q34
			0,422**	Q35
	0,932**	INTERNAL PROCESSES **IPP**	0,732**	Q37
			0,744**	Q38
			0,840**	Q39
			0,800**	Q40
			0,892**	Q41
			0,713**	Q42
	0,875**	LEARNING AND GROWTH **LGP**	0,890**	Q44
			0,894**	Q45
			0,953**	Q46
	0,435**	FINANCIAL **FP**	0,934**	Q48
			0,895**	Q49
			0,911**	Q50
Strategic Decisions Making SDM	0.921**	Product mix and pricing **PMPD**	0,913**	Q53
			0,914**	Q54
			0,910**	Q55
	0.899**	Customer relationships **CRD**	0,964**	Q57
			0,956**	Q58
	0.758**	Supplier selection and relationships **SSRD**	0,571**	Q60
			0,507**	Q61
	0.905**	Product design and development **PDDD**	0,546**	Q63
			0,505**	Q64
			0,445**	Q65
	0.841**	Other strategic decisions **OSD**	0.931**	Q67
			0.936**	Q68

Table 4. 6 : Pearson's correlation coefficients (Reliability test)

** significant at the 0.05 level of significance

- The correlation coefficients between the score of each item in the internal processes perspective and the total score of this perspective ranged between (0.712) and (0.892) which are statistically significant coefficients at the level of (0.05).
- The correlation coefficients between the score of each item in the learning and growth perspective and the total score of this perspective ranged between (0.889) and (0.953) which are statistically significant coefficients at the level of (0.05).
- The correlation coefficients between the score of each item in the financial perspective and the total score of this perspective ranged between (0.894) and (0.934) which are statistically significant coefficients at the level of (0.05).
- The correlation coefficients between the score of each item in the product mix and pricing decisions and the total score of this category of decisions ranged between (0.909) and (0.914) which are statistically significant coefficients at the level of (0.05).
- The correlation coefficients between the score of each item in the Customer relationships decisions and the total score of this category of decisions ranged between (0.964) and (0.956) which are statistically significant coefficients at the level of (0.05).
- The correlation coefficients between the score of each item in the product design and development decisions and the total score of this category of decisions ranged between (0.444) and (0.546) which are statistically significant coefficients at the level of (0.05).
- The correlation coefficients between the score of each item in the supplier selection and relationships decisions and the total score of this category of decisions ranged between (0.506) and (0.571) which are statistically significant coefficients at the level of (0.05).
- The correlation coefficients between the score of each item in the other strategic decisions and the total score of this category of decisions ranged between (0.931) and (0.936) which are statistically significant coefficients at the level of (0.05).

This indicates that all the items of the axes to which they belong have an acceptable internal consistency, which indicates that the internal validity of the questionnaire has been achieved.

Also, we can note from Table 4.6 that the correlation coefficients between the four perspectives and the BSC ranged between (0.435) and (0.935) at the level (0.05) of significance. While the correlation coefficients between the categories of strategic decisions making and SDM ranged between (0.758) and (0.921) at the level (0.05) of significance. Here we conclude that all the axes are internally consistent with the object of the questionnaire.

Another coefficient can be calculated to ensure the questionnaire internal consistency, it is Cronbach's Alpha coefficient; Table 4.7 shows values of this coefficient for each sub-variable and each variable in the questionnaire. From Table 4.5 we note that Cronbach's Alpha coefficient is very high ranging from (0.867) to (0.972), which means that there is an acceptable consistency between the items in the questionnaire.

QUESTIONS	Variables	Cronbach's Alpha coefficient	Sub-variables	Cronbach's Alpha coefficient
Q11-Q22	ABCM	0,9650	ABCM	0,9650
Q28-Q35	BSC	0,8891	Customer perspective	0,8689
Q37-Q42			Internal processes perspective	0.9101
Q44-Q46			Learning and growth perspective	0.9490
Q48-Q50			Financial perspective	0,9497
Q53-Q55	SDM	0,9460	Product mix and pricing	.09495
Q57-Q58			Customer relationships	0.9706
Q60-Q61			Supplier selection and relationships	0.9720
Q63-Q65			Product design and development	0.9366
Q67-Q68			Other strategic decisions	0.9506
Q11-Q68	Total Cronbach's Alpha coefficient			0.9710

Table 4. 7 : Cronbach's Alpha coefficient

From have been said, we conclude that the questionnaire is characterized by validity and reliability, which increases the efficiency of its performance when distributed to the sample of the study. The researcher began to distribute the questionnaire in April 2017 by sending the link of the online form of the questionnaire with a request e-mail to the group of firms that represent the sample of the study, which was randomly selected through the site of "El-Mochir" of the Algerian Chamber of Industry and Commerce.

The average length of time required to answer to the questionnaire is estimated at eight to fifteen minutes; it should be noted that the final questionnaire to be distributed was sent in both English and French*. The distribution and reception of the questionnaire was controlled via a timetable to follow the percentage of the reception over time. After one month, the sample members were reminded by a second mailing to improve the response rate. Even with that, the response rate was not very high, the total number of the respondents was only 86 respondents, which represents only 23% of the sample. However, not all of the questionnaires received were useable; as mentioned earlier in this chapter, the aim of this study is to answer if there is an impact of using ABC/M combined with BSC on SDM; therefore, the study have to be focused only on those firms that use both if ABC/M and BSC, the number of the respondent firms that use both BSC and ABC/M was only 40 firm.

* - See Appendix N 02.

Section Two: The Descriptive Statistics of the Study

This section provides a descriptive analysis of the data collected from the survey; this data was treated by using the software STATA version 12. In this section, the researcher presents the fundamental characteristics of the respondents, by reviewing: the demographic characteristics of the respondents and the descriptive results of each of the study variables.

A- The Demographic Characteristics of the Sample

The study population is characterized by a number of characteristics identified by the type of demographic variables studied in the field which are expected to have an impact on the study sample. In this study, the demographic characteristics are: the firm's type, the firm size, the industry sector, the number of employees, the job title of the respondent and his/her experience in that job. Here, we will address each element separately.

I- The Firm's Type

As shown in Table 4.8, the 40 respondents' firms include 18 public firms (45%), and 19 private firms (47.5%) and only three mixed firms (7.5%). There is not a big variation between the types of the firms in the sample.

	Q1 b	pct	cumpct
Public	18	45.00	45.00
Private	19	47.50	92.50
Mixed	3	7.50	100.00
Total	40	100.00	

Table 4. 8 : The firms' types

II- The Firm Size

This study includes micro/small businesses, medium firms and big size firms, defined by the number of their employees. It is most frequently to use the number of people employed by firms as a measure to define their size, other studies suggest that annual sales, total revenue, total assets and net worth of firms as an alternative to the number of employees. Table 4.9 presents the frequency of the size of enterprises in our sample.

	Q2 b	pct	cumpct
Micro/ Small Business	2	5.00	5.00
Medium Company	12	30.00	35.00
Big Company	26	65.00	100.00
Total	40	100.00	

Table 4. 9 : The firms' size

This can be explained by presenting the number of employees in the sample firms, as shown in Table 4.10

	Q5 b	pct	cumpct
< 200	2	5.00	5.00
200 - 500	12	30.00	35.00
501 – 1000	7	17.50	52.00
1001 – 2000	9	22.50	75.00
> 2000	10	25.00	100.00
Total	40	100.00	

Table 4. 10 : The number of employees

III- The Industry Sector

An initial sample revealed 12 main industries. As shown in Table 4.11, we note that there are six 06 food and beverage products firms (15%), three 03 textile, clothing and leather products firms (7.5%), four 04 firms form each of the energy, chemical, petroleum and related products sector and the materials for building and construction industry sector. There are also two 02 firms in both motor vehicle, mechanical products sector and the transportation and warehousing sector. In the rest of indicated sectors, there is only one firm in each (wood product manufacturing, printing, printing and allied products, iron, steel and metals products, pharmaceutical industries, telecommunication and the food and beverage stores), 25% of the firms that they did not indicate their sector of activity, they chose to fill "other sectors".

	Q6 b	pct	cumpct
Food and Beverage products	6	15.00	15.00
Textile, Clothing and Leather Products	3	7.50	22.50
Wood Product Manufacturing	1	2.50	25.00
Printing, Printing and allied products	1	2.50	27.50
Energy, Chemical, Petroleum and related products	4	10.00	37.50
Iron, steel and Metals products	1	2.50	40.00
Materials for building and construction	4	10.00	50.00
Motor Vehicle, Mechanical products	2	5.00	55.00
Pharmaceutical Industries	1	2.50	57.50
Telecommunication	1	2.50	60.00
Food and Beverage Stores	1	2.50	62.50
Transportation and Warehousing	2	5.00	67.50
Other sectors	13	32.50	100.00
Total	40	100.00	

Table 4. 11 : Sample by industry sectors

IV- The Job Title of the Respondent

There are three main categories in the job title of the respondents, the employees who have filled the questionnaire are 16 respondents from the accounting and finance department (40%), 20 respondents from the management control department (Contrôle de Gestion) which represent 50% and four 4 respondents from top management (Direction générale).

	Q69 b	pct	compact
Dep. Accounting and Finance	16	40.00	40.00
Management Control	20	50.00	90.00
Top Management	4	10.00	100.00
Total	40	100.00	

Table 4. 12 : The job title of the respondents

V- The Experience in the Job

As shown in Table 4.13, the most part of the employees who have filled the questionnaire have an experience in their jobs which exceeds five years (21 respondents,

52.5%). while only two respondents have an experience less than one year, which give pore credibility to the data collected.

	Q70 b	pct	cumpct
< 1yr	2	5.00	5.00
1 – 3yrs	12	30.00	35.00
3yr – 5 yrs	5	12.50	47.50
> 5yrs	21	52.50	100.00
Total	40	100.00	

Table 4. 13 : The experience in the job

VI- The Level of Education

As shown in Table 4.14, it turned out that most part of the respondents have a graduate education level representing 85%, while 15% are postgraduate respondents.

	Q72 b	pct	cumpct
Graduate	34	85.00	85.00
Postgraduate	6	15.00	100.00
Total	40	100.00	

Table 4. 14 : The level of education of the sample

B- Activity-based costing and Management ABC/M

The respondents have been asked if their firms use ABC/M, and for how long; from the 86 received questionnaire, only 40 respondents answered that they use ABC/M and BSC. Because of the study conceptual framework and the nature of its hypotheses, the researcher has excluded those who do not use both ABC/M and BSC. Table 4.15 presents the length of use of ABC/M, we note that the most of the respondents (26 firms, 65%) have been using ABC/M less than three years, and five 5 (12.5%) respondents used ABC/M from three to five years, while nine 9 respondents (22.5%) used it for more than five years.

	Q8 b	pct	cumpct
< 1yr	14	35.00	35.00
1 – 3yrs	12	30.00	65.00
3yr – 5 yrs	5	12.50	77.50
> 5yrs	9	22.50	100.00
Total	40	100.00	

Table 4. 15 : The length of use of ABC/M in the sample

As mentioned earlier in this chapter, ABC/M success is measured in this study through six main elements which are: management support, consensus on objectives, competitive strategy link, linkage to quality initiative, non-accounting ownership, performance evaluation/ compensation. From these elements, the researcher developed 12 sentences (two sentences for each element), these elements are from Q11 to Q22. Table 4.16 shows arithmetical means, standard deviations and T-test for the sample respondents about their opinion on the cause of success in the implementation of ABC/M.

VARIABLE	OBS	MEAN	STD. DEV.	T-TEST	RANKING	THE MEAN RESPONSE
Q11*	40	3.775	.9996794	23.8829	3	Agree
Q12	40	3.75	1.031553	22.9916	5	Agree
Q13	40	3.675	.8883145	26.1650	2	Agree
Q14	40	3.65	.8335897	27.6930	1	Agree
Q15	40	3.45	1.175607	18.5604	9	Agree
Q16	40	3.475	1.240089	17.7228	10	Agree
Q17	40	3.475	1.176424	18.6819	8	Agree
Q18	40	3.4	.9818872	21.9002	7	Agree
Q19	40	3.125	1.304578	15.1499	12	Neither agree nor
Q20	40	3.275	1.260596	16.4311	11	Neither agree nor
Q21	40	3.5	.9870962	22.4253	6	Agree
Q22	40	3.45	.9323255	23.4035	4	Agree
ABC/M	**40**	**3.5**	**.7987892**	**24.7675**		**Agree**

Table 4. 16 : Causes of success in the implementation of ABC/M

From Table 4.16, we can note that the mean ranged from 3.125 to 3.775, and the standard deviation from 0.798 to 1.304, while the T-test value has ranged from 15.149 to 27.693. the most of the respondents (in the average) answered 'Agree' on 10 sentences that measure ABC/M success, while they responded 'Neither agree nor disagree' for only two sentences. The ranking of these sentences was based on the T-test value, because it takes into account the value of standard deviations. From Table 4.16 also, it is obvious that all the sentences are statistically meaningful because the T-test value is higher than 3. As a conclusion, the respondents in this sample consider (in the average) that their firms use ABC/M successfully.

* - See Table 4.5: the questionnaire data coding.

C- The Balanced Scorecard BSC

The respondents have been asked if their firms use BSC, and for how long; from the 86 received questionnaire, only 40 respondents answered that they use BSC. Table 4.17 presents the length of use of BSC, we note that 23 firms (57.5%) have been using BSC less than three years, and ten 10 (25%) respondents used BSC from three to five years, while seven 7 respondents (17.5%) used it for more than five years.

	Q24		
	b	pct	cumpct
< 1yr	14	35.00	35.00
1 – 3yrs	9	22.50	57.50
3yr – 5 yrs	10	25.00	82.50
> 5yrs	7	17.50	100.00
Total	40	100.00	

Table 4. 17 : The length of use of the BSC

As we discussed in the conceptual framework of this study, the success in implementing BSC is due to the use of the indicated twenty 20 measures dispatched on its four perspectives. these measures are from Q28 to Q50 Table 4.18 shows arithmetical means, standard deviations and T-test for the sample respondents about their opinion on the cause of success in the implementation of the BSC.

From Table 4.18, we can note the perspective which ranked as the first is the financial perspective with a T-test value of 51.543 and a mean of 4.733; the respondents indicate that they use (in average) frequently all the measures of this perspective (Q48: Return on investment, Q49: Operating income and Q50: Sales growth). The mean in this perspective is between 4.7 and 4.75 and the standard variation is between 0.63 and 0.648, while the T-test value is between 45.839 and 47.653. From these results, we can conclude that the financial perspective is used in a significant manner.

The second perspective in the ranking is the customer perspective with a T-test value of 38.92, and a mean of 3.812. The respondents of the sample see (in the average) that the performance measures of this perspective are occasionally to frequently used in the following order:

1) Q35: Market share;
2) Q30: Number of customer complaints;
3) Q28: Customer response time;

4) Q29: Survey of customer satisfaction;
5) Q31: On-time delivery;
6) Q32: Cycle time from order to delivery;
7) Q34: Warranty repair cost; and:
8) Q33: Percent shipments returned due to poor quality.

VARIABLE	N	MEAN	SD	T-TEST	RANKING	THE MEAN RESPONSE
Q28*	40	4.175	.930605	28.3740	3	Occasionally
Q29	40	3.575	.9841696	28.3740	4	Occasionally
Q30	40	3.9	.7778999	31.7082	2	Occasionally
Q31	40	3.925	.8883145	27.9449	5	Occasionally
Q32	40	3.5	.9058216	24.4374	6	Occasionally
Q33	40	3.575	1.034966	21.8464	8	Occasionally
Q34	40	3.375	.8969321	23.7982	7	sometimes
Q35	40	4.475	.8766925	32.2831	1	Frequently
CP	**40**	**3.8125**	**.6195273**	**38.9206**	**2**	**Occasionally**
Q37	40	3.925	.944281	26.2887	2	Occasionally
Q38	40	4.075	.9167249	28.1137	1	Occasionally
Q39	40	3.725	.9604353	24.5295	3	Occasionally
Q40	40	3.675	.9710555	23.9355	4	Occasionally
Q41	40	3.575	1.059451	21.3415	5	Occasionally
Q42	40	3.8	1.159133	20.7339	6	Occasionally
IPP	**40**	**3.795833**	**.7876246**	**30.4802**	**3**	**Occasionally**
Q44	40	3.575	1.129727	20.0139	3	Occasionally
Q45	40	3.75	1.103607	21.4905	2	Occasionally
Q46	40	3.85	1.098951	22.1571	1	Occasionally
LGP	**40**	**3.725**	**1.012423**	**23.2699**	**4**	**Occasionally**
Q48	40	4.75	.6304252	47.6530	1	Frequently
Q49	40	4.7	.6484696	45.8393	3	Frequently
Q50	40	4.75	.6304252	47.6530	2	Frequently
FP	**40**	**4.733333**	**.5807942**	**51.5436**	**1**	**Frequently**
BSC	**40**	**3.9325**	**.6229119**	**39.9275**		

FP = FINANCIAL PERSPECTIVE, CP = CUSTOMER PERSPECTIVE, IPP = INTERNAL PROCESSES PERSPECTIVE, LGP = LEARNING AND GROWTH PERSPECTIVE.

Table 4. 18 : The degree of use of BSC performance measures in the sample

* - See Table 4.5: the questionnaire data coding.

In the customer perspective, the mean ranged from 3.375 to 4.475, the standard variation between 0.876 to 1.034and the T-test value from 21.846 to 32.283; which means that firms in the sample use this perspective significantly.

The third perspective in the ranking is the internal processes perspective with a mean of 3.795, a standard deviation of 0.787 and a T-test value of 30.48. The respondents of the sample see (in the average) that the performance measures of this perspective are occasionally used in the following order:

1) Q38: Ratio of good output to total output;
2) Q37: Manufacturing lead time;
3) Q39: Labor efficiency variance;
4) Q40: Material efficiency variance;
5) Q41: Rate of material scrap rate; and:
6) Q42: Percent defective products shipped.

The mean of measures used in this perspective ranged from 3.575 to 4.075, the standard deviation from 0.916 to 1.159 and the T-test value from 20.733 to 28.113. This means that the internal processes perspective is used by the firms in this sample significantly.

The learning and growth perspective is ranked in the fourth position with a mean of 3.725, a standard deviation of 1.012 and a T-test value of 23.269. according to the respondents, the performance measures used in this perspective (Q46: Number of new product launches, Q45: Time to market new product and Q44: Number of new patents) were occasionally used. Their means ranged from 3.57 to 3.85, their standard deviation from 1.098 to 1.129 and their T-test values from 20.013 to 22.157. For this sample, we can say that the learning and growth perspective is used significantly.

The T-test value of the BSC variable is 39.927 and the mean is 3.93; from these results, we conclude that the respondents in the study sample use the balanced scorecard BSC in an appropriate manner.

D- Strategic Decisions Making SDM

The respondents were asked in the fourth section of the questionnaire to give their opinion about the extent of effectiveness of their firm's strategic decisions. In this

study, as discussed earlier in this chapter, strategic decisions making SDM is considered as a dependent variable; the researcher want to verify if there is an impact from using ABC/M and BSC combined on SDM. This study divides strategic decisions into five categories: decisions about: product mix and pricing, decisions about: customer relationships, decisions about: supplier selection and relationships, decisions about: product design and development and other strategic decisions; under each category, there are from two to three decisions. The respondents responded on a five-point Likert scale ranging from one (strongly disagree) to five (strongly agree).

Table 4.19 shows the mean, the standard deviation and the T-test value of each category of strategic decisions.

VARIABLE	N	MEAN	SD	T-TEST	RANKING	THE MEAN RESPONSE
Q53	40	3.825	1.009887	23.9546	3	Agree
Q54	40	3.875	1.017476	24.0867	2	Agree
Q55	40	3.875	.9919548	24.7064	1	Agree
PMP	**40**	**3.858333**	**.9179672**	**26.5829**	**4**	Agree
Q57	40	3.8	.9660918	24.8768	2	Agree
Q58	40	3.725	.8766925	26.8726	1	Agree
CR	**40**	**3.7625**	**.884246**	**26.9112**	**3**	Agree
Q60	40	3.5	.7161149	30.9112	1	Agree
Q61	40	3.425	.7807787	27.7436	2	Agree
SSR	**40**	**3.4625**	**.7195752**	**30.4329**	**1**	Agree
Q63	40	3.8	1.090754	22.0337	3	Agree
Q64	40	4.075	.9971112	25.8472	1	Agree
Q65	40	3.975	.9996794	25.1482	2	Agree
PDD	**40**	**3.95**	**.9200211**	**27.1537**	**2**	Agree
Q67	40	3.275	.8766925	23.6262	2	Neither agree nor
Q68	40	3.55	.9044052	24.8253	1	Agree
OSD	**40**	**3.4125**	**.8311831**	**25.9661**	**5**	Agree
SDM	**40**	**3.725**	**.7596014**	**31.0149**		Agree

PMP=DECISIONS ABOUT: PRODUCT MIX AND PRICING, CR=DECISIONS ABOUT: CUSTOMER RELATIONSHIPS, SSR=DECISIONS ABOUT: SUPPLIER SELECTION AND RELATIONSHIPS, PDD=DECISIONS ABOUT:

Table 4. 19 : The sample opinion about Strategic Decisions Making

From table 4.19 we note that the sample's opinion about the degree of effectiveness of the strategic decisions is 'Agree' on the most decisions and 'Neither agree nor disagree' on only one decision "Acquire or merge with another company"; the first category in the ranking is decisions about supplier selection and relationships

with a mean of 3.462, a standard deviation of 0.719 and a T-test value of 30.432. The decisions mean -under this category- are between 3.425 and 3.5, the standard deviations are between 0.716 and 0.780 and the T-test values are between 27.743 and 30.911. The respondents' opinion (in the average) about the effectiveness of making these decisions is 'Agree'.

The second category of decisions in the ranking is the decisions about product design and development with a mean of 3.95, a standard deviation of 0.920 and a T-test value of 27.153. Decisions falling under this category were arranged as follows:

1) Q64: Improve production processes;
2) Q65: Invest inflexible technology; and:
3) Q63: Redesign products.

The mean ranges from 3.8 to 4.075, the standard deviation between 0.997 and 1.090 and the T-test value between 22.033 and 25.847. The respondents' opinion (in the average) about the effectiveness of making these decisions is 'Agree'.

Third is the category of decisions related to customers relationships, with a mean of 3.76, a standard deviation of 0.884 and a T-test value of 26.91. Under this category, there are two decisions; the mean of these two is 3.725 and 3.8, the standard deviation is 0.876 and 0.966 and the T-test value is 24.876 and 26.872. The respondents' opinion (in the average) about the effectiveness of making these decisions is 'Agree'.

Fourth in the ranking, comes the category of decisions about: product mix and pricing with a mean of 3.858, a standard deviation of 0.917 and a T-test value of 26.582. Decisions falling under this category were arranged as follows:

1) Q55: Repricing existing products or services;
2) Q54: Discontinue a product or withdraw from a market; and:
3) Q53: Introduce a new product or service.

The mean ranges from 3.875 to 3.825, the standard deviation between 0.991 and 1.017 and the T-test value between 23.954 and 24.706. the respondents' opinion (in the average) about the effectiveness of making these decisions is 'Agree'.

Finally, the category ‘other strategic decisions’ in in the fifth place with a mean of 3.412, a standard deviation of 0.831 and a T-test value of 25.966. The mean of the decisions that come under this category ranges between 3.275 and 3.55, the standard deviation between 0.876 and 0.904 and the T-test value between 23.626 and 24.825. the opinion of the respondents about the effectiveness of making the decision 'Acquire or merge with another company is 'Neither agree nor disagree’, while that opinion is ‘Agree’ on the decision ‘Change the strategy in an operational department'. Strategic decisions making in this sample is seen as effective regarding to the T-test value of the whole variable SDM which is 31.014.

Section Three: The Regression Analysis and Hypotheses Testing

Each empirical study includes variables, these variables may be main and maybe sub-variables. In this study, activity-based costing and management ABCM and the balanced scorecard BSC are two main independent variables while strategic decisions making SDM is a main dependent variable. The BSC variable is subdivided into four sub-variables which are its four perspectives (Financial, Customer, Internal Processes and Learning and Growth), and SDM is subdivided into five sub-variables which are the categories of decisions (Product mix and pricing, Customer relationships, Supplier selection and relationships, Product design and development and Other strategic decisions). The purpose of this section is to analyze the correlation and regression models extracted from the study sample to test the hypotheses validity in order to make the study more representative of the reality and more generalizable to the studied population.

A- The main hypothesis H1 testing (ABC/M and BSC on SDM)

The main hypothesis of this study comes as an answer for the main problem “Is there an impact of using ABC/M combined with BSC on strategic decisions making SDM?”. This hypothesis was:

H0: There is a positive impact of using activity-based costing and management ABC/M combined with Balanced Scorecard BSC on Strategic Decisions Making.

To test this hypothesis, a regression model has been formed using the following equation:

$$SDM = \alpha + \beta_1 ABC/M + \beta_2 BSC$$

The regression model results for this hypothesis are presented in Table 4.20. From the regression output, it can be seen that there is a significant positive relationship between both ABC/M and BSC on SDM. The equation with the regression results is:

$$SDM = 0.372 + 0.434\ ABC/M + 0.466 BSC$$

H0		Strategic Decision Making
Balanced Scorecard	β_2	0.466**
	t	(3.06)
ABC/M	β_1	0.434***
	t	(4.09)
Constant	α	0.372
	t	(0.79)
Observations		40
R^2		0.655
F		35.06
t statistics in parentheses		
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$		

Table 4. 20 : The regression model for H0

From Table 4.20, we note that the coefficient of determination R^2 is (0.655) which means that (65.5%) of the changes in strategic decisions making is due to the use of activity-based costing/management combined with the balanced scorecard. The regression beta coefficient of ABC/M (β_1= 0.434) is positive and significant at the level of ($p < 0.001$, t=4.09). Also, the beta coefficient of BSC (β_2= 0.466) represent a positive and significant value at the level of ($p < 0.01$, t=3.06). This effect is confirmed by the value of Fischer's test (35.06) which is significant at the level of (0.00), compared with the Fischer's Test table (F Tab) value Which amounted to (3.23).

After this analysis, we can test the combined impact as a multiplication of the two independent variables (ABCM and BSC). In this case the new model will be:

$$SDM = \alpha + \beta_1 ABCM * BSC$$

The regression results of this model are shown in Table 4.21.

		Strategic Decision Making
ABC/M*BSC	β_1	0.124***
	t	(7.85)
Constant	α	1.977***
	t	(8.41)
Observations		40
R^2		0.618
F		61.60
t statistics in parentheses *** $p < 0.001$		

Table 4. 21 : The combined effect model of ABCM and BSC on SDM

From Table 4.21, we can outline that the relationship between the combination of activity-based costing/management and the balanced scorecard is positive and significant with a 61.8% determination percentage and a F test value of 61.60. As a conclusion, we can say that the main hypothesis which states that there is a positive impact of using activity-based costing and management ABC/M combined with Balanced Scorecard BSC on Strategic Decisions Making is accepted.

This hypothesis can be fragmented into four hypotheses by using the four perspectives of the balanced scorecard as independent sub-variables, and the categories of strategic decisions making as independent sub-variables.

B- Testing the hypothesis H11 (ABC/M and FP and CP on PMPD)*

This hypothesis analyzes if there is an impact from using activity-based costing/management combined with the financial perspective and the customer perspective on product mix and pricing decisions.

H11: There is a positive impact of using activity-based costing and management ABC/M combined with the financial and customer perspectives on decisions about product mix and pricing.

To test this hypothesis, a regression model has been formed using the following equation:

* FP= Financial perspective, CP= Customer perspective, PMPD= product mix and pricing decisions.

$$PMPD = \alpha + \beta_1 ABCM + \beta_2 FP + \beta_3 CP$$

While:

- PMPD = Product Mix and Pricing Decisions;
- ABCM = Activity-Based Costing/Management;
- FP = The Financial Perspective of BSC; and:
- CP = The Customer Perspective of BSC.

Table 4.22 shows the regression model results for this hypothesis. From the regression output, we can see that there is a significant positive relationship between ABC/M and product mix and pricing decisions, a significant positive relationship between the customer perspective and product mix and pricing decisions, while there is a negative relationship with no significance between the financial perspective and product mix and pricing decisions. The equation with the regression results is:

$$PMPD = 0.395 + 0.560\, ABCM - 0.0977 FP + 0.515\, CP$$

H11	Product Mix Decisions	
ABCM	β_1	0.560***
	t	(4.16)
Financial Perspective	β_2	-0.0977
	t	(-0.51)
Customer Perspective	β_3	0.515*
	t	(2.45)
Constant	α	0.395
	t	(0.44)
Observations		40
R^2		0.609
F		18.67
t statistics in parentheses		
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$		

Table 4. 22 : The regression model for H11

From Table 4.22, we note that the coefficient of determination R^2 is (0.609), which means that (60.9%) of the changes in the product mix decisions is due to the use of activity-based costing/management ABCM combined with the financial perspective and the customer perspective of the balanced scorecard BSC. The regression beta coefficient of ABC/M (β_1= 0.560) is positive and significant at the level of ($p < 0.001$, t=4.16). Also, the beta coefficient of the customer perspective (β_3= 0.515) represent a positive and

significant value at the level of (p < 0.05, t=2.45). while the impact of the financial perspective is negative but not significant, the beta coefficient is (β_2=-0.097, t= -0.51). This effect is confirmed by the value of Fischer's test (18.67) which is significant at the level of (0.00), compared with the Fischer's Test table (F Tab) value Which amounted to (3.23).

To get more confirmation, another model derived from initial H11 model, the new model will analyze the effect between ABCM combined with financial perspective and the ABCM combined with customer perspective on product mix and pricing decisions. The new equation will be:

$$PMPD = \alpha + \beta_1 ABCM * FP + \beta_2 ABCM * CP$$

While:

- PMPD = Product Mix and Pricing Decisions;
- ABCM = Activity-Based Costing/Management;
- FP = The Financial Perspective of BSC; and:
- CP = The Customer Perspective of BSC.

		Product Mix Decisions
ABCM *FP	β_1	-0.0245
	t	(-0.44)
ABCM *CP	β_2	0.177**
	t	(3.09)
Constant	α	1.856***
	t	(5.12)
Observations		40
R^2		0.591
F		26.83
t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$		

Table 4. 23 : The combined effect model of ABCM, FP and CP on PMPD

As shown in Table 4.23, the results of this new model confirm that the combination of ABCM and the financial perspective has no significant effect on product mix and pricing decisions, while there is a significant positive relationship between the

combination of ABCM with the customer perspective and the product mix and pricing decisions with a R^2 of (59.1%) and a F value of (26.83).

These results may be theoretically explained that there is no significant relationship between the financial perspective and the product and mix decisions; however, this category of decisions is affected by the use of activity-based/management combined with the customer perspective. This hypothesis is partially accepted.

C- Testing the hypothesis H12 (ABC/M and FP and CP on CRD)*

This hypothesis analyzes if there is an impact from using activity-based costing/management combined with the financial perspective and the customer perspective on customer relationships decisions.

H12: There is a positive impact of using activity-based costing and management ABC/M combined with the financial and customer perspectives on decisions about customer relationships.

To test this hypothesis, a regression model has been formed using the following equation:

$$CRD = \alpha + \beta_1 ABCM + \beta_2 FP + \beta_3 CP$$

While:

- CRD = Customer Relationships Decisions;
- ABCM = Activity-Based Costing/Management;
- FP = The Financial Perspective of BSC; and:
- CP = The Customer Perspective of BSC.

* FP= Financial perspective, CP= Customer perspective, CRD= customer relationships decisions.

Table 4.24 shows the regression model results for this hypothesis. From the regression output, we can see that there is a significant positive relationship between ABC/M and customer relationships decisions, a positive but not significant relationship between the customer perspective and customer relationships decisions, while there is a negative relationship with no significance between the financial perspective and customer relationships decisions. The equation with the regression results is:

$$CRD = 1.662 + 0.624\,ABCM - 0.241FP + 0.277\,CP$$

H12		Customer Relationships Decisions
ABCM	β_1	0.624^{***}
	t	(4.64)
Financial Perspective	β_2	-0.241
	t	(-1.25)
Customer Perspective	β_3	0.277
	t	(1.32)
Constant	α	1.662
	t	(1.85)
Observations		40
R^2		0.580
F		16.60
t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$		

Table 4. 24 : The regression model for H12

From Table 4.24, we outline that the coefficient of determination R^2 is (0.580), which means that (58%) of the changes in the customer relationships decisions is due to the use of activity-based costing/management ABCM combined with the financial perspective and the customer perspective of the balanced scorecard BSC. The regression beta coefficient of ABC/M (β_1= 0.624) is positive and significant at the level of ($p < 0.001$, t=4.64). Also, the beta coefficient of the customer perspective (β_3= 0.277) represent a positive but not significant value at the level of ($p < 0.05$, t=1.32). while the impact of the financial perspective is negative but not significant, the beta coefficient is (β_2=-0.241, t= -1.25). This effect is confirmed by the value of Fischer's test (16.60) which is significant

at the level of (0.00), compared with the Fischer's Test table (F Tab) value Which amounted to (3.23).

To get more confirmation, another model derived from initial H11 model, the new model will analyze the effect between ABCM combined with financial perspective and the ABCM combined with customer perspective on product mix and pricing decisions. The new equation will be:

$$CRD = \alpha + \beta_1 ABCM * FP + \beta_2 ABCM * CP$$

While:

- CRD = Customer Relationships Decisions;
- ABCM = Activity-Based Costing/Management;
- FP = The Financial Perspective of BSC; and:
- CP = The Customer Perspective of BSC.

		Customer Relationships Decisions
ABCM *FP	β_1	-0.0271
	t	(-0.45)
ABCM *CP	β_2	0.160*
	t	(2.60)
Constant	α	2.031***
	t	(5.12)
Observations		40
R^2		0.489
F		17.74

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. 25 : The combined effect model of ABCM, FP and CP on PMPD

As shown in Table 4.25, the results of this new model confirm that the combination of ABCM and the financial perspective has no significant effect on customer relationships decisions, while there is a significant positive relationship between the combination of ABCM with the customer perspective and the customer relationships decisions with a R^2 of (48.9%) and a F value of (17.74).

These results may be theoretically explained that there is no significant relationship between the financial perspective and the customer relationships decisions; however, this

category of decisions is affected by the use of activity-based/management combined with the customer perspective. This hypothesis can be partially accepted.

D- Testing the hypothesis H13 (ABC/M and IPP and LGP on SSRD)*

Now, we move to the other two perspectives of the BSC; this hypothesis analyzes if there is an impact from using activity-based costing/management combined with the internal processes perspective and the learning and growth perspective on supplier selection and relationships decisions.

H13: There is a positive impact of using activity-based costing and management ABC/M combined with the internal processes and learning-growth perspectives on decisions about supplier selection and relationships.

To test this hypothesis, a regression model has been formed using the following equation:

$$SSRD = \alpha + \beta_1 ABCM + \beta_2 IPP + \beta_3 LGP$$

While:

- SSRD = Supplier Selection and Relationships Decisions;
- ABCM = Activity-Based Costing/Management;
- IPP = The Internal Processes Perspective of BSC; and:
- LGP = The Learning and Growth Perspective of BSC.

Table 4.26 shows the regression model results for this hypothesis. From the regression output, we can see that there is a positive significant relationship between the learning and growth perspective and the supplier selection and relationships decisions. While the other two independent variables (ABCM and IPP) have no significant relationship with the decisions about supplier selection and relationships. The equation with the regression results is:

$$SSRD = 1.647 + 0.180\ ABCM - 0.0218\ IPP + 0.340\ LGP$$

*- IPP= internal processes perspective, LGP= learning and growth perspective, SSRD= supplier selection and relationships decisions.

H21	Supplier Selection Decision	
ABC/M	β_1	0.180
	t	(1.18)
Internal processes Perspective	β_2	-0.0218
	t	(-0.10)
Learning and Growth Perspective	β_3	0.340*
	t	(2.04)
Constant	α	1.647**
	t	
Observations		40
R^2		0.401
F		8.03
t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$		

Table 4. 26 : The regression model for H13

From Table 4.26, we outline that the coefficient of determination R^2 is not high (0.401), which means that only (40.1%) of the changes in the supplier selection and relationships decision is due to the use of activity-based costing/management ABCM combined with the internal processes perspective and the learning and growth perspective of the balanced scorecard BSC. The regression beta coefficient of ABC/M (β_1= 0.180) is positive but not significant at the level of ($p < 0.05$, t=1.18). The beta coefficient of the internal processes perspective (β_3= -0.0218) represent a negative but not significant value at the level of ($p < 0.05$, t=-0.10). While the impact of the learning and growth perspective is significant and positive, the beta coefficient is (β_2=0.370, t= 2.04). This effect is confirmed by the value of Fischer's test (8.03) which is significant compared with the Fischer's Test table (F Tab) value Which amounted to (3.23).

For more validation, another model derived from the initial H13 model, the new model will analyze the effect between ABCM combined with internal processes perspective and the ABCM combined with learning and growth perspective on supplier selection and relationships decisions. The new equation will be:

$$SSRD = \alpha + \beta_1 ABCM * IPP + \beta_2 ABCM * LGP$$

While:

- SSRD = Supplier Selection and Relationships Decisions;
- ABCM = Activity-Based Costing/Management;

- IPP = The Internal Processes Perspective of BSC; and:
- LGP = The Learning and Growth Perspective of BSC.

		Supplier Selection Decision
ABCM *IPP	β_1	-0.0114
	t	(-0.23)
ABCM *LGP	β_2	0.0877
	t	(1.94)
Constant	α	2.423***
	t	(9.10)
Observations		40
R^2		0.386
F		11.67

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. 27 : The combined effect model of ABCM, IPP and LGP on SSRD

As shown in Table 4.27, it is obviously seen that the R^2 is too low (38.6%), and none of the relationships between the independent variables (ABCM*IPP and ABCM*LGP) and the dependent variable (SSRD) is significant. These results lead us to reject this hypothesis; there is no significant effect of using ABCM combined with the internal processes perspective and the learning and growth perspective on the supplier selection and relationships decisions.

E- Testing the hypothesis H14 (ABC/M and IPP and LGP on PDDD)*

This final hypothesis analyzes the effect of using activity-based costing/management combined with the internal processes and the learning and growth perspective on the product design and development decisions.

H14: There is a positive impact of using activity-based costing and management ABC/M combined with the internal processes and learning-growth perspectives on decisions about Product design and development.

To test this hypothesis, a regression model has been formed using the following equation:

$$PDDD = \alpha + \beta_1 ABCM + \beta_2 IPP + \beta_3 LGP$$

*- IPP= internal processes perspective, LGP= learning-growth perspective, PDDD= Product design and development.

While:

- PDDD = Product Design and Development Decisions;
- ABCM = Activity-Based Costing/Management;
- IPP = The Internal Processes Perspective of BSC; and:
- LGP = The Learning and Growth Perspective of BSC.

Table 4.28 shows the regression model results for this hypothesis. From the regression output, we can see that there is a positive significant relationship between each one of the independent variables (ABC/M, the internal processes perspective and the learning and growth perspective) and the product design and development decisions. The equation with the regression results is:

$$PDDP = 0.878 + 0.108\,ABCM + 0.365\,IPP + 0.351\,LGP$$

H21		Product Design Decision
ABC/M	β_1	0.108
	t	(0.65)
Internal processes Perspective	β_2	0.365
	t	(1.50)
Learning and Growth Perspective	β_3	0.351
	t	(1.92)
Constant	α	0.878
	t	(1.72)
Observations		40
R^2		0.559
F		15.23
t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$		

Table 4. 28 : The regression model for H14

From Table 4.28, we outline that the coefficient of determination R^2 is acceptable (0.559), which means that (55.9%) of the changes in the product design and development decisions is due to the use of activity-based costing/management ABCM combined with the internal processes perspective and the learning and growth perspective of the balanced scorecard BSC. All the regression beta coefficients are positive but not significant (β_1= 0.108, t= 0.65) (β_2=0.365, t= 1.50) (β_3= 0.351, t= 1.92). The value of Fischer's test (8.03) is significant compared with the Fischer's Test table (F Tab) value Which amounted to (3.23).

To check for more confirmation, another model derived from initial H14 model, the new model will analyze the effect between ABCM combined with internal processes perspective and the ABCM combined with learning and growth perspective on product design and development decisions. The new equation will be:

$$PDDD = \alpha + \beta_1 ABCM * IPP + \beta_2 ABCM * LGP$$

While:

- PDDD = Product Design and Development Decisions;
- ABCM = Activity-Based Costing/Management;
- IPP = The Internal Processes Perspective of BSC; and:
- LGP = The Learning and Growth Perspective of BSC.

		Product Design and Development Decisions
ABCM *IPP	β_1	0.0368
	t	(0.62)
ABCM *LGP	β_2	0.0797
	t	(1.50)
Constant	α	2.356***
	t	(7.50)
Observations		40
R^2		0.478
F		16.94
t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$		

Table 4. 29: The combined effect model of ABCM, IPP and LGP on PDDD

As shown in Table 4.27, it is visible that the R^2 is low (47.8%), and none of the relationships between the independent variables (ABCM*IPP and ABCM*LGP) and the dependent variable (PDDD) is significant. These results lead us not to accept this hypothesis; there is no significant effect of using ABCM combined with the internal processes perspective and the learning and growth perspective on the product design and development decisions.

This chapter discussed the empirical study to answer the main problem of this thesis and to test its hypothesis; First, the researcher presented the conceptual framework which consisted of defining the research variables and how to measure each variable. Then, the researcher discussed the choice of the survey as a research methodology after reviewing some literature in the field. After that, the population of the study was defined as the firms registered in the Algerian Business Directory (Annuaire des Entreprises Algériennes) from the official website of the Algerian Chamber of Commerce and Industry. From that population, a study sample was selected by using the Krejcie and Morgan method of sampling. The study tool in this research was the questionnaire, which was formed in five sections to collect the necessary data for the study. After the primary distribution of the questionnaire, a validity and reliability tests were undertaken to check the internal consistency of the questionnaire.

In the second section of this chapter, the researcher displayed the descriptive statistics of the study, by addressing the results of each part of the questionnaire, and the data collected about the study variables in general. Finally, the hypotheses of this thesis have been tested using the multiple regression model for each hypothesis. This operation led to the confirmation of the main hypothesis which was: There is a positive impact of using activity-based costing and management ABC/M combined with Balanced Scorecard BSC on Strategic Decisions Making. The sub-hypotheses which analyzed the impact of using activity-based costing and management ABC/M combined with the financial and customer perspectives on decisions about product mix and pricing and customer relationships were partially accepted, because the impact of the financial perspective was ignored. While the sub-hypotheses which analyzed the impact of using activity-based costing and management ABC/M combined with the internal processes and learning-growth perspectives on decisions about supplier selection and relationships and product design and development were not accepted given their weak regression model results.

Conclusion

Conclusion

This study main question was about the linkage between activity-based costing/management ABC/M and the balanced scorecard BSC and their combined effect on strategic decisions making improvement, this main question was divided into two sub-questions as follow: Is there an impact between activity-based information combined with the financial and customer relationship perspectives on decisions about product mix and pricing and customer relationships? And: Is there an impact between activity-based information combined with the internal processes and the learning-growth perspectives on decisions about Supplier selection and relationships and Product design and development?

The objectives of this study were three main objectives; one, To show the importance and utility of using new techniques of managerial accounting such as activity-based costing and management and the balanced scorecard, two: To display how ABC/M and BSC can be used to serve the strategic cost management, and three: To study the impact of using ABC/M and the BSC on Strategic Decisions making in Algerian context.

In order to achieve these objectives, the researcher has structured the thesis into four chapters. The first chapter was about Activity-based Costing and Management ABC/M system, by addressing how did this system rise after the fall of traditional costing systems. Activity-based costing ABC came to the literature of management accounting in the 1980s, it was introduced as a better alternative costing system in line with the major environmental developments, this costing system was based on the idea that products do not consume resources directly, but the resources consumption is due to the manner in which the company performs in order to produce and deliver these products to customers. The ABC system has spread to be used worldwide in many industries, and it proved its benefits to produce more accurate and useful cost information to serve both operational and strategic domains. ABC was first just a costing system, but with the use of its information about activities and cost drivers, it became evident that managers might use this information to affect the costs of those activities. This led to the emergence of activity-based management system which concerns the activity performance measurement and cost management using ABC information. A cross model between ABC and ABM has been developed by academics and practitioners in the management accounting area which was called activity-based cost management ABC/M. Using this cross-model ABC/M proved its worthiness in terms of the quality of cost information and process management.

In the second chapter, the researcher addressed the Balanced Scorecard BSC by discussing its concept and importance for performance measurement and strategic management. The balanced scorecard was introduced by Kaplan and Norton in the 1990s as a performance measurement tool by merging both financial and non-financial measures from different perspectives which are: the financial perspective, the customer perspective, the internal processes perspective and the learning and growth perspective. Its appraisal was an answer to the limitations of the traditional performance measurement systems. After widespread use of the BSC in many sectors and the different studies that were conducted about it, the BSC showed that it could be used as strategic management and a communication tool. The use of strategy maps based on the four perspectives can offer a useful instrument for translating strategy into a clear and understandable set of measures and initiatives for all the personnel of the organization. Now, BSC is worldwide known as an important strategic management system.

The third chapter address the concept and pillars of Strategic Cost management based on the analysis of Shank and Govindarajan. Then, the relationships between its instruments and ABC/M and BSC has been discussed to illustrate how can these two systems work in combination to serve the strategic context and strategic decisions making.

Finally, an empirical study is conducted in the fourth chapter to answer the research questions and test the hypotheses. After presenting the conceptual framework and defining how to measure each variable in this study, a survey questionnaire has been prepared and arbitrated then sent to a sample of Algerian companies. The data used in this chapter has been collected from using questionnaire survey administered to a sample of companies, the number of useable questionnaires was only 40 questionnaires; so, the examination of the hypotheses of the study was conducted these useable questionnaires.

The study results:

This study reached a number of results; here, we summarize the most important ones:

- Using Activity-based costing and management ABC/M information can lead to better understanding of costs in the organization,
- Activity-based costing and management ABC/M make decisions about cost reduction and management clearer and more effective.

- ABC/M approach can be used as a source of useful information for the purpose of product design and development, and also for process Improvement.
- The activity-based view can also be used in the budgeting process (ABB).
- The Balanced Scorecard BSC is a powerful tool to measure the organization's performance by merging financial and non-financial indicators from different perspectives (financial, customer, internal processes and learning and growth).
- The Balanced Scorecard BSC can be used as a strategic management system, through the translation of the organization's vision and strategy into a specific set of objectives and measures that include all levels of the organization and work on its implementation.
- BSC can play a communicative role throughout the whole organization; it allows employees at all levels to understand how to participate in attaining its objectives and implementing its vision and strategy.
- ABC/M can be linked to strategic cost management tools such as Target Costing and Life cycle Costing.
- ABC/M can be combined with the BSC perspectives to provide better performance measurement and strategic linkage.
- Strategic decisions need a reliable and accurate information base to be effective decisions.

The Hypotheses testing results:

The analysis of data collected in the survey suggests that there is a significant relationship between using activity-based costing and management system ABC/M and the balanced scorecard BSC combined on strategic decisions making improvement; this result confirms the main hypothesis H1.

The sub-hypotheses which analyzed the impact of using activity-based costing and management ABC/M combined with the financial and customer perspectives on decisions about product mix and pricing and customer relationships were **partially accepted**; there is a positive effect of combining ABC/M and the customer perspective on those both types of strategic decisions, while the impact of the financial perspective was ignored.

The sub-hypothesis which analyzed the impact of using activity-based costing and management ABC/M combined with the internal processes and learning-growth

perspectives on decisions about supplier selection and relationships was not accepted given their weak regression model results. While in the model used to test this hypothesis, we found that the learning and growth perspective has a positive and significant relationship with the supplier selection decisions.

The last sub-hypothesis analyzed the impact of using activity-based costing and management ABC/M combined with the internal processes and learning-growth perspectives on decisions about product design and development. The regression model revealed that there is a positive but not significant relationship between the dependent variable and the independent variable for this hypothesis; thus, it cannot be accepted given the weak regression results.

This study research represents a step that complements the previous research in the field of management accounting, which focused on the integration of ABC/M and BSC. Although the results of this research are important contributions to the body of knowledge in this field, there are still other aspects that need to be explored in the future. Here, the researcher suggests some topics that can constitute a research interest:

- The appropriateness of the Algerian business environment to adopt and apply modern methods of strategic managing accounting.
- Determinants of strategic decision making among Algerian executives.
- Using the interaction between ABM and BSC in nonprofit sectors.

References

References:

Abernethy, M., & Brownell, P. (1999). The role of budgets in organisations facing strategic change. *Accounting, Organizations and Society*, *24*(3), 189–204.

Adkins, T. (2006). *Case Studies in Performance Management: A Guide from the Experts*. New Jersey: John Wiley & sons Inc.

Ahmed, N. (1995). A design and implementation model for life cycle cost management system. *Information & Management*, *28*(4), 261–269.

Al-Ghamdi, S. M. (1998). Obstacles to successful implementation of strategic decisions: the British experience. *European Business Review*, *98*(6), 322–327.

Alexander, L. D. (1985). Successfully Implementing Strategic Decisions. *Long Range Planning*, *18*(3), 91–97.

Ansari, S., Bell, J., & Okano, H. (2006). Target costing: Uncharted research territory. In S. M. D. Chapman Christopher S., Hopwood Anthony G. (Ed.), *Handbooks of management accounting research*. Oxford, U.K.: Elsevier Ltd.

Asiedu, Y., & Gu, P. (1998). Product life cycle cost analysis: state of the art review. *International Journal of Production Research*.

Atkinson, A., & Kaplan, R. (1998). *Advanced management accounting* (3rd Editio). New Jersey: Prentice Hall.

Atkinson, A., Kaplan, R. S., Matsumura, E. M., & Young, S. (2012). *Advanced management accounting* (6th Editio). New Jersey: Pearson Education.

Atkinson, A., Kaplan, R., & Young, S. (2007). *Management accounting: Information for Decision Making and Strategy Execution*. New Jersey: Pearson Education.

Bahnub, B. (2010). *Activity-Based Management for Financial Institutions: Driving Bottom-Line Results*. New York: John Wiley & sons.

Barfield, J., Raiborn, C., & Kinney, M. (2001). *Cost accounting: traditions and innovations* (4th Editio). South Western Educational Publishing.

Barnabè, F. (2011). A “system dynamics-based Balanced Scorecard” to support strategic decision making Insights from a case study. *International Journal of Productivity and Performance Management*, *60*(5), 446–473.

Barringer, H. P., & Weber, P. D. (1996). Life-cycle cost tutorial. *Fifth International Conference on Process Plant Reliability, Houston, Texas.*, *34*(9), 913–923.

Beasley, M., Chen, A., Nunez, K., & Wright, L. (2006). Working hand in hand: Balanced scorecards and enterprise risk management. *Strategic Finance*, *87*(9 (Mar 2006)), 49–55.

Ben-Arieh, D., & Qian, L. (2003). Activity-based cost management for design and development stage. *International Journal of Production Economics*, *83*(2), 169–183.

Berliner, C., & Brimson, J. (1988). *Cost management for today's advanced manufacturing: The CAM-I conceptual design*. Boston MA: Harvard Business School Press.

Bescos, P., & Mendoza, C. (1994). *Le management de la performance: expériences et méthodologies de mise en oeuvre pour une comptabilité de gestion moderne*. Paris: Editions Comptables Malesherbes,.

Bhutta, K., & Huq, F. (2002). Supplier selection problem: a comparison of the total cost of ownership and analytic hierarchy process approaches. *Supply Chain Management: An International Journal*, *7*(3), 126–135.

Blocher, E., Stout, D. E., & Cokins, G. (2010). *Cost management: A strategic emphasis* (5th Ed). New York: McGraw-Hill.

Bouquin, H. (1997). Management accounting in its social context: Rimailho revisited. *Accounting, Business & Financial History*, *7*(3), 315–343.

Bouquin, H. (2003). *La comptabilité de gestion* (2eme Ed). Paris: Economica.

Brimson, J. (1991). *Activity accounting: an activity-based costing approach*. New York: John Wiley & sons.

Brimson, J., & Antos, J. (2000). Activity-Based Budgeting. In B. BRINKER (Ed.), *Guide to Cost Management* (pp. 457–477). New York: John Wiley & sons.

Cardoş, I. R., & Cardoş, V. D. (2014). Measuring Customer Profitability with Activity-Based Costing and Balanced Scorecard. *Annales Universitatis Apulensis Series Oeconomica*, *16*(1), 52–60.

Carmona, S. (2006). The history of management accounting in France, Italy, Portugal, and Spain. In C. S. Chapman, A. G. Hopwood, & M. D. Shields (Eds.), *Handbooks of*

management accounting research VOL 2 (pp. 905–922). Oxford, U.K.: Elsevier Ltd.

Chenhall, R. H. (2009). Accounting for the Horizontal Organization. In C. S. Chapman, A. G. Hopwood, & M. D. Shields (Eds.), *Handbook of Management Accounting Research Vol 3* (pp. 1207–1233). Oxford, U.K.: Elsevier Ltd.

Citroen, C. L. (2011). The role of information in strategic decision-making. *International Journal of Information Management*, *31*(6), 493–501.

Clark, J., & Casson, M. (1923). *Studies in the economics of overhead costs*. Chicago: University of Chicago Press.

Cobbold, I. M., & Lawrie, G. J. G. (2002). The development of the balanced scorecard as a strategic management tool. In *Proceedings of the 3rd International Conference on Performance Measurement and Management* (Vol. Julry 2002). Boston, MA.

Cokins, G. (1996). *Activity-based cost management: making it work*. New York: McGraw Hill.

Cokins, G. (2001). *Activity-based cost management: an executive's guide*. New York: John Wiley & sons.

Cokins, G. (2002). Integrating Target Costing and ABC. *Journal of Cost Management*, *16*(04), 13–22.

Cooper, R. (1995). *When Lean Enterprises Collide: Competing Through Confrontation*. Boston MA: Harvard Business Press.

Cooper, R, & Slagmulder, R. (1997). *Target costing and value engineering*. Portland, Oregon: Productivity Press.

Cooper, R, & Slagmulder, R. (1998). Strategic Cost Management: What is Strategic Cost Management? *Management Accounting*, *79*(7), 14–16.

Cooper, Robin, & Kaplan, R. S. (1991). *The Design of Cost Management Systems*. New York: Prentice-Hall.

Cooper, Robin, & Slagmulder, R. (2004). Achieving full-cycle cost management. *MIT Sloan Management Review*, *46*(01 Fall 2004), 45–52.

Daly, J. (2002). *Pricing for profitability: activity-based pricing for competitive advantage*. New York: John Wiley & sons.

Davenport, T. (1993). *Process innovation: reengineering work through information technology*. Boston MA: Harvard Business School Press.

Davila, A., & Wouters, M. (2004). Designing cost-competitive technology products through cost management. *Accounting Horizons*, *18*(1), 13–26.

De Rongé, Y. (1998). *Comptabilité de gestion*. Bruxelles: Edition De Boeck Université.

Dean, J. W., & Sharfman, M. P. (1996). Does Decision Process Matter? A Study Of Strategic Decision-making Effectiveness. *Academy of Management Journal*, *39*(2), 368–396.

Drucker, P. (2001). *The essential Drucker :the best of sixty years of Peter Drucker's essential writings on management*. New York: HarperCollins.

Drury, C. (2012). *Management and cost accounting* (11th Ed). Hampshire: Cengage Learning.

Duff, R. Le, Cliquet, G., & Vailhen, C. (1999). *Encyclopédie de la gestion et du management: EGM*. Paris: Dalloz.

Egbunike, P. A., Blessing, I. N., & Chigozie, G. E. (2015). The Use of Activity Based Costing and Balance Score Card for Strategic Performance Measurement: Perception of Chartered Accountants in Anambra State, Nigeria. *American Journal of Economics, Finance and Management*, *1*(3), 211–222.

El Kelety, I. A. E. M. A. (2006). *Towards a conceptual framework for strategic cost management - The concept, objectives, and instruments* -. Chemnitz University.

Ellram, L., & Siferd, S. (1998). Total cost of ownership: a key concept in strategic cost management decisions. *Materials Engineering*, *19*(1), 55–84.

Elmezughi, A. M. (2007). *The Relationship between Activity-Based Costing and the Balanced Scorecard and their combined Effect on Organizational Performance under Alternative Competitive Strategy*. University of Southern Queensland Australia.

Emblemsvåg, J. (2001). Activity-based life-cycle costing. *Managerial Auditing Journal*, *16*(1), 17–27.

Emblemsvåg, J. (2003). *Life-cycle costing: using activity-based costing and Monte Carlo methods to manage future costs and risks*.

Evans, P., & Wurster, T. (1997). Strategy and the New Economics of Information. *Harvard Business Review*, *75*(5), 71–82.

Ewert, R., & Ernst, C. (1999). Target costing, co-ordination and strategic cost management. *European Accounting Review*, *8*(01), 23–49.

Feil, P., Yook, K., & Kim, I. (2004). Japanese target costing: a historical perspective. *International Journal of Strategic Cost Management*, *2*(4 Spring 2004), 10–19.

Figge, F., Hahn, T., Schaltegger, S., & Wagner, M. (2002). The Sustainability Balanced Scorecard - linking sustainability management to business strategy. *Business Strategy and the Environment*, *11*(5), 269–284.

Flesser, N., & Fisher, J. (2000). Target costing. In B. J. BRINKER (Ed.), *Guide to Cost Management*. New York: John Wiley & Sons.

Frishammar, J. (2003). Information use in strategic decision making. *Management Decision*, *41*(4), 318–326.

Gänswein, W. (2011). *Effectiveness of Information Use for Strategic Decision Making*. Wiesbaden: Gabler Verlag.

Gosselin, M. (2007). A review of activity-based costing: technique, implementation, and consequences. In C. S. Chapman, A. G. Hopwood, & M. D. Shields (Eds.), *Handbooks of management accounting research* (pp. 641–671). Oxford, U.K.: Elsevier Ltd.

Gupta, M., & Galloway, K. (2003). Activity-based costing/management and its implications for operations management. *Technovation*, *23*(2), 131–138.

Hansen, R. D., & Mowen, M. M. (2006). *Cost management: accounting and control* (05th Ed). Ohio: Thomson South-Western.

Harrison, E. F., & Pelletier, M. A. (1993). A Typology of Strategic Choice. *Technological Forecasting and Social Change*, *44*(3), 245–263.

Harrison, F. E. (1996). A process perspective on strategic decision making. *Management Decision*, *34*(1), 46–53.

Harrison, F. E., & Pelletier, M. A. (2001). Revisiting strategic decision success. *Management Decision*, *39*(3), 169–180.

Hax, A., & Majluf, N. (1991). *The Strategy Concept and Process: A Pragmatic Approach.* New Jersey: Prentice-Hall.

Helms, M. M. (2006). *Encyclopedia of Management* (5th ed.). Detroit: Thomson Gale.

Hickson, D. J., Butler, R. J., Cray, D., Mallory, G. R., & Wilson, C., D. (1986). Top Decisions: Strategic Decision Making in Organizations. *San Francisco: Jossey-Bass*, *39*(7), 26–42.

Hilton, W. R. (2005). *Managerial Accounting Creating Value in a Dynamic Business Environment, 9th*. New York: McGraw-Hill.

Hinterhuber, H. (1997). Strategic cost management: Preliminary Lessons form European Companies. *International Journal Technology Management-Special Issue on Strategic Cost Management*, *13*(01), 01–14.

Hoque, Z., Mia, L., & ALam, M. (2001). Market Competition, Computer-Aided Manufacturing and Use Of Multiple Performance Measures: An Empirical Study. *British Accounting Review*, *33*(1), 23–45.

Horngren, C. T., Datar, S. M., & Rajan, M. V. (2012). *Cost accounting: A managerial emphasis* (14th Ed). London: Pearson Education.

Howell, R., & Skurai, M. (1992). Management Accounting (and other) Lessons from Japanese. Management Accounting. *Institute of Management Accountants*, *24*(06), 28–34.

Ibusuki, U., & Kaminski, P. (2007). Product development process with focus on value engineering and target-costing: a case study in an automotive company. *International Journal of Production Economics*, *105*(2), 459–474.

Institute of Management Accountants (IMA). (1994). Implementing target costing. In *Statement on Management Accounting*. Retrieved from http://www.imanet.org/docs/default-source/thought_leadership/management_control_systems/implementing_target_costing.pdf?sfvrsn=2

Institute of Management Accountants (IMA). (1998). Tools and Techniques for Implementing Target Costing. In *Statement on Management Accounting 4GG*. Retrieved from http://www.imanet.org/docs/default-

source/research/sma/toolsandtechstargetcost.pdf?sfvrsn=2

Johnson, H. T., & Kaplan, R. S. (1987). *Relevance lost: the rise and fall of management accounting*. *Harvard Business School Press,*. Boston MA.

Kaplan, R. S., & Cooper, R. (1998). *Cost & effect: using integrated cost systems to drive profitability and performance*. Boston MA: Harvard Business School Press.

Kaplan, R. S., & Norton, D. P. (1992). The Balanced Scorecard: Measures that Drive Performance. *Harvard Business Review*, *70*(01 January–February), 71–79.

Kaplan, R. S., & Norton, D. P. (1993). Putting the Balanced Scorecard to Work. *Harvard Business Review*, *71*(05 September–October), 134–147.

Kaplan, R. S., & Norton, D. P. (1996a). Linking the Balanced Scorecard to Strategy. *California Management Review*, *39*(01), 53–79.

Kaplan, R. S., & Norton, D. P. (1996b). *The balanced scorecard: Translating strategy into action*. Boston, MA: Harvard Business School Press.

Kaplan, R. S., & Norton, D. P. (1996c). Using the balanced scorecard as a strategic management system. *Harvard Business Review*, *74*(1 (January–February)), 75–85.

Kaplan, R. S., & Norton, D. P. (2000). Having Trouble with Your Strategy? Then Map It. *Harvard Business Review*, *78*(05(September–October 2000)), 167–176.

Kaplan, R. S., & Norton, D. P. (2001a). *Strategy focused organization: How balanced scorecard companies thrive in the new business environment*. Boston, MA: Harvard Business School Press.

Kaplan, R. S., & Norton, D. P. (2001b). Transforming the Balanced Scorecard from Performance Measurement to Strategic Management: Part I. *Accounting Horizons*, *15*(01), 87–104.

Kaplan, R. S., & Norton, D. P. (2001c). Transforming the Balanced Scorecard from Performance Measurement to Strategic Management: Part II. *Accounting Horizons*, *15*(2), 147–160.

Kaplan, R. S., & Norton, D. P. (2004a). Measuring the strategic readiness of intangible assets. *Harvard Business Review*, *82*(2 Feb 2004), 21–33.

Kaplan, R. S., & Norton, D. P. (2004b). *Strategy Maps: Converting Intangible Assets into*

Tangible Outcomes. Boston: Harvard Business School Press.

Kaplan, R. S., Norton, D. P., & Rugelsjoen, B. (2010). Managing Alliances with the Balanced Scorecard. *Harvard Business Review*, *88*(01 January–February), 114–120.

Kato, Y. (1993). Target costing support systems: lessons from leading Japanese companies. *Management Accounting Research*, *4*(4), 33–47.

Khataie, A. H., Bulgak, A. A., & Segovia, J. J. (2011). Activity-Based Costing and Management applied in a hybrid Decision Support System for order management. *Decision Support Systems*, *52*(1), 142–156.

Kinney, M., & Raiborn, C. (2011). *Cost accounting: Foundations and evolutions*. Hampshire: Cengage Learning.

Korpi, E., & Ala-Risku, T. (2008). Life cycle costing: a review of published case studies. *Managerial Auditing Journal*, *23*(3), 240–261.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, *30*, 607–610.

Kreuze, J., & Newell, G. (1994). ABC and life-cycle costing for environmental expenditures. *Strategic Finance*, *75*(8), 38–42.

Kumaran, S. D., Ong, K. S., Nee, A. Y. C., & Tan, H. R. B. (2002). Evaluation of life cycle cost analysis methodologies. *Corporate Environmental Strategy*, *9*(1), 30–39.

Lemarchand, Y. (2002). The military origins of the French management accounting model: a return to the mechanisms of accounting change. *Accounting History*, *7*(1), 23–57.

Liberatore, M. J., & Miller, T. (1998). A framework for integrating Activity-Based Costing and the Balanced Scorecard into the Logistics Strategy Development and Monitoring Process. *Journal of Business Logistics*, *19*(2), 131–154.

Lindholm, A, & Suomala, P. (2007). Learning by costing: Sharpening cost image through life cycle costing? *International Journal of Productivity and Performance Management*, *56*(8), 651–672.

Lindholm, Anni, & Suomala, P. (2005). Present and future of life cycle costing: reflections from Finnish companies. *LTA*, *2*(05), 282–292.

Lorino, P. (1991). *Le contrôle de gestion stratégique: la gestion par les activités*. Paris:

DUNOD.

Lorino, P. (2003). *Méthodes et pratiques de la performance: le pilotage par les processus et les compétences*. Paris: Éditions d'Organisation.

MacArthur, J. (2000). Activity-Based Costing and Activity-Based Management: An Introduction. In B. Brinker (Ed.), *Guide to Cost Management* (p. chapter 22, 397-409). New York: John Wiley & Sons.

Maiga, A. S., & Jacobs, F. A. (2003). Balanced Scorecard, Activity-Based Costing And Company Performance: An Empirical Analysis. *Journal of Managerial Issues*, *15*(3 (Fall 2003)), 283–301.

Major, M., & Hoque, Z. (2005). Activity-based costing: concepts, processes and issues. In Z Hoque (Ed.), *Handbook of Cost and Management*. London: Spiramus.

Maria, M. (2012). Cost measurement and cost management in target costing. In A. Dodescu (Ed.), *Annals of the University of Oradea, Economic* (pp. 533–547).

McIlhattan, R. D. (1992). The Path to Total Cost Management. In B. Brinker (Ed.), *Emerging Practices in Cost Management* (pp. M1-1-M1-6). Warren: Gorham & Lamont.

Mevellec, P. (2009). *Cost systems design*. Hampshire: Palgrave Macmillan.

Monden, Y., & Hamada, K. (1991). Target Costing and Kaizen Costing in Japanese Automobile Companies. *Journal of Management Accounting Research*, *03*(Fall 1991), 16–34.

Mooraj, S., Oyon, D., & Hostetter, D. (1999). The balanced scorecard: a necessary good or an unnecessary evil? *European Management Journal*, *17*(5), 481–491.

Newing, R. (1995). Wake up to the balanced scorecard. *Management Accounting*, *73*(3), 22–25.

Niven, P. R. (2002). *Balanced scorecard step-by-step: Maximizing performance and maintaining results*. New York: John Wiley & sons Inc.

Niven, P. R. (2005). *Balanced scorecard diagnostics: Maintaining maximum performance*. New Jersey: John Wiley & sons.

Niven, P. R. (2006). *Balanced scorecard step-by-step: Maximizing performance and*

maintaining results. New Jersey: John Wiley & sons.

Niven, P. R. (2008). *Balanced scorecard: Step-by-step for government and nonprofit agencies* (2nd ED). New Jersey: John Wiley & sons.

Niven, P. R. (2014). *Balanced scorecard evolution : a dynamic approach to strategy execution*. New Jersey: John Wiley & sons.

Okano, K. (2001). Life cycle costing-An approach to life cycle cost management: A consideration from historical development. *Asia Pacific Management Review*, *6*(3), 317–341.

Olve, N.-G., Petri, C.-J., Roy, J., & Roy, S. (2003). *Making Scorecards Actionable*. West Sussex: John Wiley & Sons.

Papadakis, V., & Barwise, P. (1997). Strategic Decisions: an introduction. In V. Papadakis & P. Barwise (Eds.), *Strategic Decisions* (pp. 1–15). New York: Springer Science+Business Media.

Person, R. (2009). *Balanced Scorecards and Operational Dashboards with Microsoft Excel*. Indianapolis: Wiley Publishing, Inc.

Porter, M. E. (1998). *Competitive advantage, creating and sustaining superior performance: With a New Introduction*. New York: The Free Press.

Raffish, M., & Turney, P. (1991). The CAM-I Glossary of Activity-Based Management, CAM-I, Arlington, Texas. *Patrz: The CAM-I ABC Basic Model, Załącznik B*.

Ravignon, L., Bescos, P., & Joalland, M. (2003). *Méthode ABC/ABM rentabilité mode d'emploi* (2eme Ed). Paris: Edition d'Organisation.

Rivero, E. J. R., & Emblemsvåg, J. (2007). Activity-based life-cycle costing in long-range planning. *Review of Accounting and Finance*, *6*(4), 370–390.

Rusjan, B. (2005). Model for manufacturing strategic decision making. *International Journal of Operations & Production Management*, *25*(8), 740–761.

Sakurai, M. (1989). Target costing and how to use it. *Journal of Cost Management*, (Summer), 39–50.

Sakurai, M. (1996). *Integrated cost management*. Portland, Oregon: Productivity Press.

Sekaran, U., & Bougie, R. (2016). *Research Methods for Business A Skill-Building Approach* (7TH ed.). West Sussex: John Wiley & sons Ltd.

Shank, J., & Govindarajan, V. (1993). *Strategic Cost Management: The New Tool for Competitive Advantage*. New York: The Free Press.

Shieds, M. D. (1995). An empirical analysis of firms' implementation experiences with activity-based costing. *Journal of Management Accounting Research*, *7*(Fall 95), 148–166.

Siau, C., & Lindt, D. (1997). Cost Driver Analysis in the Airline Industry. *Journal of Cost Management*, *July/Augus*, 37–47.

Smith, M. (2003). *Research Methods in Accounting*. London: SAGE Publications Ltd.

Smith, R. F. (2007). *Business Process Management and the Balanced Scorecard: Using Processes as Strategic Drivers*. New Jersey: John Wiley & Sons.

Smith, W., Lewis, G., & Churchwell, T. (2002). Integrating activity-based costing, target costing, and value engineering for supply chain improvement. In IEEE (Ed.), *Automation Congress, 2002 Proceedings of the 5th Biannual World* (pp. 447–452).

Srinivasan, R. (2014). *Strategic Business Decisions A Quantitative Approach*. New Delhi: Springer.

Stevenson, T. H., Barnes, F. C., & Stevenson, S. A. (1993). Activity-based Costing: An Emerging Tool for Industrial Marketing Decision Makers. *Journal of Business & Industrial Marketing*, *8*(2), 40–52.

Taleghani, M. (2017). Synergistic Role of Balanced Scorecard/Activity Based Costing and Goal Programming Combined Model on Strategic Cost Management. *International Journal of Economics and Financial Issues*, *7*(3), 586–593.

Theriou, N. G., & Theriou, G. N. (2007). Integrating the Balanced Scorecard and Activity-Based Costing. *Journal of Cost Management*, *21*(3 May/Jun), 42–48.

Tsutsui, W. (1998). *Manufacturing ideology: Scientific management in twentieth-century Japan*. New Jersey: Princeton University Press.

Turney, P. B. (1996). *Activity-Based Costing: The Performance Breakthrough*. London: Kogan Page Limited.

Walters, B. A., Jiang, J. J., & Klein, G. (2003). Strategic information and strategic decision making: the EIS/CEO interface in smaller manufacturing companies. *Information & Management*, *40*(6), 487–495.

Welfle, B., & Keltyka, P. (2000). Global Competition: The New Challenge for Management Accountants. *Management Accounting Research*, *7*(2), 30–36.

Wheelen, T. L., & Hunger, J. D. (2012). *Strategic management and business policy toward global sustainability* (13th ed). Boston: Pearson Education.

Wilson, D. (2005). strategic decision-making. In J. McGee (Ed.), *The Blackwell Encyclopedia of Management: Strategic Management*. Malden, MA: Blackwell Publishing Ltd.

Woodward, D. G. (1997). Life cycle costing—theory, information acquisition and application. *International Journal of Project Management*, *15*(6), 335–344.

Wu, S.-I., & Chen, J.-H. (2012). The performance evaluation and comparison based on enterprises passed or not passed with ISO accreditation. *International Journal of Quality & Reliability Management*, *29*(3), 295–319.

Yu-Lung, H., & Chun-Chu, L. (2010). Environmental performance evaluation and strategy management using balanced scorecard. *Environ Monit Assess*, *170*, 599–607.

Appendices

Appendix N 1: the questionnaire in English

MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH

HIGHER SCHOOL OF COMMERCE

Doctoral thesis questionnaire submitted in the fulfillment of requirements for the Degree of 'Doctorate of science' in management sciences, Title:

The linkage between Balanced Score Card "BSC" and Activity-based Costing/Management "ABC/M" to improve strategic decisions making

By: FERZIZI Ibrahim

Statement of purpose: To explore the effect of combining Activity-based Costing/Management ABC/M and the Balanced ScoreCard BSC on the improvement of strategic decisions Making

This survey has been designed for anonymity, your name, department or organization are not required. I would appreciate your answering all the questions in the survey, since all questions are interrelated and important for making a comprehensive evaluation

Section A: General information

Organization Type:

- □ Public
- □ Private
- □ Mixed

Your firm Size

- □ Micro/ Small Business
- □ Mediem Company
- □ Big Company
- □ Multi-National Company

How frequently are products/services or major redesigns introduced

- □ Never
- □ Rarely
- □ Occasionally
- □ Frequently
- □ Very Frequently

Products or Services Organization offer for sale:

- □ 5 or less
- □ 06 – 10
- □ 11 - 20
- □ 21 - 60
- □ 51 or more

Number of Employees in Organization

- □ < 200
- □ 200 - 500
- □ 501 - 1000
- □ 1001 - 2000
- □ > 2000

Industry (please choose the most dominant Industry your firm operates in):

Manufacturing:

- □ Food and Beverage products
- □ Textile, clothing and Leather Products
- □ Wood Product Manufacturing
- □ Printing, Printing and allied products
- □ Chemical, Petroleum and related products
- □ Iron, steel and Metals products
- □ Computer and Peripheral Equipment products
- □ Motor Vehicle, Mechanical products
- □ Medical Equipment and Supplies Products
- □ Pharmaceutical Industries
- □ Other: …….

Services:

- □ Tourism
- □ Financial
- □ Entertainment
- □ Health
- □ Education
- □ Other: …….

Retail Trade:

- □ Motor Vehicles and Parts Dealers
- □ Electronics and Appliance Stores
- □ Food and Beverage Stores
- □ Clothing and Clothing Accessories Stores
- □ Other: …….

Other Industries:

- □ Agriculture, Forestry, Fishing & Hunting
- □ Mining
- □ Transportation and Warehousing
- □ Other: …….

Section B: Activity-based Costing/Management system:

Activity-based Costing is a method for calculating costs of cost objects (products, services, customers…) based on the amount of activities performed to get those cost objects, by using causal allocation bases. while Activity-based Management consists on how to manage costs by relaying on ABC information.

Does your firm use Activity-based Costing/Management? ☐ **Yes** ☐ **No**

If yes: how long has your firm used ABC/M? ☐ **< 1yr** ☐ **1 – 3yr s** ☐ **3yr – 5 yrs** ☐ **> 5yrs**

If No: please state the reasons for not using it: ……

…….

In your opinion, your firm has succeeded in the implementation of ABC/M Because:	**Please choose the appropriate option using this scale:** 1 (Strongly disagree)	2	3 (Neither agree nor disagree)	4	5 (Strongly agree)
- ABC/M initiative has a strong top management support.	☐	☐	☐	☐	☐
- Top management has provided enough resources to the implementation of ABC/M system.	☐	☐	☐	☐	☐
- There is a consensus about and clarity of the objectives of ABC/M system.	☐	☐	☐	☐	☐
- ABC/M system designers and users are agreed that the information is produced efficiently and is effectively used.	☐	☐	☐	☐	☐
- ABC/M system is effectively linked to the competitive strategy.	☐	☐	☐	☐	☐
- The competitive strategy designers use the information of ABC/M system.	☐	☐	☐	☐	☐
- ABC/M system is closely tied to the quality initiatives.	☐	☐	☐	☐	☐
- Initiatives like Total Quality Management, ISO, Quality Cost Analysis, are made in light of ABC/M system.	☐	☐	☐	☐	☐
- The use of ABC/M system is totally reserved to the accounting employees.	☐	☐	☐	☐	☐
- Non-accounting employees (Engineering, Marketing, Production…) are committed to the use of ABC/M information.	☐	☐	☐	☐	☐
- ABC/M system is used for performance evaluation/ compensation.	☐	☐	☐	☐	☐
- ABC/M information is used to evaluate performance of the employees, and to motivate and reward them.	☐	☐	☐	☐	☐

Section C: The Balanced ScoreCard BSC:

Balance Scorecard is a performance measurement system and a tool for strategic alignment. BSC merge both financial and non-financial performance measures by using four perspectives of the firm, the financial perspective, the customer perspective, the internal processes perspective and the learning and growth perspective.

Does your firm use The Balanced ScoreCard BSC? ☐ **Yes** ☐ **No**

If yes: how long has your firm used BSC? ☐ **< 1yr** ☐ **1 – 3yr s** ☐ **3yr – 5 yrs** ☐ **> 5yrs**

If No: please state the reasons for not using it: ……

…….

In your opinion, your firm has succeeded in the implementation of BSC Because the amount of use of these indicators:	**Please choose the appropriate option using this scale:** 1 (Never) 2 3 (Sometimes) 4 5 (Frequently)				
• **Customer perspective**					
- **Customer response time**	☐	☐	☐	☐	☐
- **Survey of customer satisfaction**	☐	☐	☐	☐	☐
- **Number of customer complaints**	☐	☐	☐	☐	☐
- **On-time delivery**	☐	☐	☐	☐	☐
- **Cycle time from order to delivery**	☐	☐	☐	☐	☐
- **Percent shipments returned due to poor quality**	☐	☐	☐	☐	☐
- **Warranty repair cost**	☐	☐	☐	☐	☐
- **Market share**	☐	☐	☐	☐	☐
• **Internal process perspective**					
- **Manufacturing lead time**	☐	☐	☐	☐	☐
- **Ratio of good output to total output**	☐	☐	☐	☐	☐
- **Labor efficiency variance**	☐	☐	☐	☐	☐
- **Material efficiency variance**	☐	☐	☐	☐	☐
- **Rate of material scrap rate**	☐	☐	☐	☐	☐
- **Percent defective products shipped**	☐	☐	☐	☐	☐
• **Learning and growth perspective**					
- **Number of new patents**	☐	☐	☐	☐	☐
- **Time to market new product**	☐	☐	☐	☐	☐
- **Number of new product launches**	☐	☐	☐	☐	☐
• **Financial perspective**					
- **Return on investment**	☐	☐	☐	☐	☐
- **Operating income**	☐	☐	☐	☐	☐
- **Sales growth**	☐	☐	☐	☐	☐

Section D: Strategic Decisions Making

In your opinion, your firm has made the strategic decisions stated below effectively:	**Please choose the appropriate option using this scale:** 1 (Strongly disagree) 2 3 (Neither agree nor disagree) 4 5 (Strongly agree)				
• **Decisions about: Product mix and pricing**					
- Introduce a new product or service	☐	☐	☐	☐	☐
- Discontinue a product or withdraw from a market	☐	☐	☐	☐	☐
- Re pricing existing products or services	☐	☐	☐	☐	☐
• **Decisions about: Customer relationships**					
- Open and start up a new plant or facility	☐	☐	☐	☐	☐
- Expand operations to enter a new market	☐	☐	☐	☐	☐
• **Decisions about: Supplier selection and relationships**					
- Supplier selection	☐	☐	☐	☐	☐
- Supplier Abandoning	☐	☐	☐	☐	☐
• **Decisions about: Product design and development**					
- Redesign products	☐	☐	☐	☐	☐
- Improve production processes	☐	☐	☐	☐	☐
- Invest in flexible technology	☐	☐	☐	☐	☐
• **Other strategic decisions**					
- Acquire or merge with another company	☐	☐	☐	☐	☐
- Change the strategy in an operational department	☐	☐	☐	☐	☐

Section F: Demographic Information

Your Job Title: ……..……, **For how Long(years):** ……

Your Age:
- ☐ 20 – 29
- ☐ 30 – 39
- ☐ 40 – 49
- ☐ 50 or more

Level of Education
- ☐ Secondary
- ☐ Graduate
- ☐ Postgraduate
- ☐ Professional degree

Your experience in Accounting and Finance Area (years)
- ☐ < 5
- ☐ 5 – 10
- ☐ 11 – 20
- ☐ > 20

Would you like to get a summary of the findings of this research? ☐ Yes ☐ No

If Yes:

- Include your business card with this questionnaire upon return, your details will remain confidential and not be disclosed. Or
- Send a request to this e-E-mail: ferzizi@gmail.com

Thank you in advance for your time and effort, it is very much appreciated.

Appendix N 2: the questionnaire in French

MINISTERE DE L'ENSEIGNEMENT SUPERIEUR ET DE LA RECHERCHE SCIENTIFIQUE

ECOLE SUPERIEURE DE COMMERCE

Questionnaire relatif à une thèse soumise pour l'obtention d'un 'Doctorat' en sciences de gestion.

Intitulée

Le lien entre Le Tableau de Bord Prospectif «BSC» et la comptabilité/gestion a base des activités «ABC/M» pour améliorer la prise de décision stratégique

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Énoncé de l'objectif : Étudier l'effet de la combinaison de la comptabilité/gestion a base des activités ABC/M et Le Tableau de Bord Prospectif BSC sur l'amélioration de décision stratégique.

Ce questionnaire est anonyme, les informations relatives à votre identité, votre département ou le nom de votre entreprise ne sont pas indispensables. Nous vous prions de répondre à toutes les questions car elles sont toutes interdépendantes et indispensable pour mener une évaluation complète.

Section A: Informations générales

Type d'entreprise:

- ☐ Publique
- ☐ Privée
- ☐ Capital mixte

La taille de l'entreprise

- ☐ Micro/Petite entreprise
- ☐ Moyenne entreprise
- ☐ Grande entreprise
- ☐ Multinationale

À quelle fréquence les produits / services ou les redesigns majeures sont-ils introduits?

- ☐ Jamais
- ☐ Rarement
- ☐ Parfois
- ☐ Fréquemment
- ☐ Très fréquemment

Nombre de produits ou services offert a la vente:

- ☐ 5 ou moins
- ☐ 06 – 10
- ☐ 11 - 20
- ☐ 21 - 60
- ☐ 51 ou plus

Nombre d'employés

- ☐ < 200
- ☐ 200 - 500
- ☐ 501 - 1000
- ☐ 1001 - 2000
- ☐ > 2000

Industrie (veuillez choisir l'industrie la plus dominante dans laquelle votre entreprise active)

Fabrication:

- ☐ Produits alimentaires et boissons
- ☐ Textile, vêtements et produits en cuir
- ☐ Fabrication de produits en bois
- ☐ Impression, impression et produits connexes
- ☐ Chimie, Pétrole et produits connexes
- ☐ Fer, acier et produits métalliques
- ☐ Produits informatiques et périphériques
- ☐ Véhicules motorisés, produits mécaniques
- ☐ Equipements médicaux et fournitures médicales
- ☐ Industries pharmaceutiques
- ☐ Autres: …….

Services :

- ☐ Tourisme
- ☐ Finance
- ☐ Divertissement
- ☐ Santé
- ☐ Education
- ☐ Autres: …….

Commerce de detail :

- ☐ Véhicules motorisés et concessionnaires de pièces détachées
- ☐ Magasins d'appareils électroniques et ménagers
- ☐ Magasins de produits alimentaires
- ☐ Magasins de vêtements et d'accessoires
- ☐ Autres: …….

Autres industries :

- ☐ Agriculture, foresterie, pêche et chasse
- ☐ Exploitation minière
- ☐ Transport et entreposage
- ☐ Autres: …….

Section B: Système de comptabilité/gestion base des activités (Activity-based Costing/Management):

La comptabilité base des activités ABC est une méthode de calcul des coûts (produits, services, clients...) basée sur les activités réalisées pour obtenir ces produits, en utilisant des bases d'allocation causale, alors que la Gestion par Activité consiste à gérer les coûts en se basant sur les informations de l'ABC.

Votre entreprise utilise -t-elle la comptabilité/gestion base des activités ? ☐ **Oui** ☐ **Non**

Si Oui, depuis combien de temps ? ☐ **< 1an** ☐ **1 – 3ans** ☐ **3 – 5 ans** ☐ **> 5ans**

Si Non, pour quelle raisons ?.....……..…
……

A votre avis, Votre entreprise a réussi à mettre en œuvre ABC /M Parce que :	**Veuillez choisir l'option appropriée en utilisant cette échelle :** 1 (En total désaccord)	2	3 (Indifférent)	4	5 (Tout à fait d'accord)
- L'initiative ABC/M bénéficie d'un fort soutien de la part de la direction.	☐	☐	☐	☐	☐
- La direction a fourni suffisamment de ressources pour la mise en œuvre du système ABC/M.	☐	☐	☐	☐	☐
- Il y a un consensus et clarté des objectifs du système ABC/M..	☐	☐	☐	☐	☐
- Les concepteurs et les utilisateurs du système ABC/M sont d'accord que le système produit l'information de manière efficace et qu'elle est utilisée efficacement.	☐	☐	☐	☐	☐
- Le système ABC/M est efficacement lié à la stratégie concurrentielle.	☐	☐	☐	☐	☐
- Les concepteurs de stratégie compétitive utilisent les informations du système ABC/M.	☐	☐	☐	☐	☐
- Le système ABC/M est étroitement lié aux initiatives de qualité.	☐	☐	☐	☐	☐
- Des initiatives telles que la Gestion de la Qualité Totale, ISO, l'Analyse des Coûts de la Qualité, sont réalisées à la lumière du système ABC/M.	☐	☐	☐	☐	☐
- L'utilisation du système ABC/M est totalement réservée aux employés comptables.	☐	☐	☐	☐	☐
- Les employés non-comptables (Ingénierie, Marketing, Production...) sont engagés dans l'utilisation des informations ABC/M.	☐	☐	☐	☐	☐
- Le système ABC/M est utilisé pour l'évaluation de la performance/compensation	☐	☐	☐	☐	☐

- L'information ABC/M est utilisée pour évaluer la performance des employés, pour les motiver et les récompenser.	☐	☐	☐	☐	☐

Section C: Le Tableau de Bord Prospectif (The Balanced ScoreCard BSC):

BSC est un système de mesure de la performance et un outil d'alignement stratégique. BSC fusionne les mesures de performance financière et non financière en utilisant quatre perspectives de l'entreprise, la perspective financièr, la perspective du client, la perspective des processus internes et la perspective d'apprentissage et de croissance.

Votre entreprise utilise -t-elle le Tableau de Bord Prospectif BSC ? ☐ **Oui** ☐ **Non**

Si Oui: Depuis combien de temps ? ☐ **< 1an** ☐ **1 – 3 ans** ☐ **3 – 5 ans** ☐ **> 5 ans**

Si Non, pour quelle raisons ?.....……..…
……

À votre avis, votre entreprise a réussi à mettre en œuvre BSC en raison de l'utilisation des indicateurs suivants :

Veuillez choisir l'option appropriée en utilisant cette échelle :

1 2 3 4 5

Jamais ⟷ **Parfois** ⟷ **Souvent**

• **Perspective du Client**					
- **Temps de réponse du client**	☐	☐	☐	☐	☐
- **Sondage sur la satisfaction du client**	☐	☐	☐	☐	☐
- **Nombre de plaintes du client**	☐	☐	☐	☐	☐
- **Délais de livraison respectés**	☐	☐	☐	☐	☐
- **Temps de cycle de la commande à la livraison**	☐	☐	☐	☐	☐
- **Pourcentage d'expéditions retournées en raison d'une mauvaise**	☐	☐	☐	☐	☐
- **Coût de réparation sous garantie**	☐	☐	☐	☐	☐
- **Part de marché**	☐	☐	☐	☐	☐
• **Perspective du processus interne**					
- **Délai de fabrication**	☐	☐	☐	☐	☐
- **Ratio de bonne production à la production totale**	☐	☐	☐	☐	☐
- **Variance de l'efficacité du travail**	☐	☐	☐	☐	☐
- **Variance d'efficacité matière**	☐	☐	☐	☐	☐
- **Taux de rebut de matière**	☐	☐	☐	☐	☐
- **Pourcentage de produits défectueux expédiés**	☐	☐	☐	☐	☐
• **Perspective d'apprentissage et de croissance**					
- **Nombre de nouveaux brevets d'invention**	☐	☐	☐	☐	☐
- **Temps pour commercialiser un nouveau produit**	☐	☐	☐	☐	☐
- **Nombre de nouveaux produits lancés**	☐	☐	☐	☐	☐
• **Perspective financière**					
- **Retour sur investissement**	☐	☐	☐	☐	☐
- **Résultat d'exploitation**	☐	☐	☐	☐	☐
- **Croissance du chiffre d'affaires**	☐	☐	☐	☐	☐

Section D : Prise de décisions stratégiques

A votre avis, votre entreprise a pris les décisions stratégiques ci-après indiquées efficacement :	**Veuillez choisir l'option appropriée en utilisant cette échelle :** **1** **2** **3** **4** **5** **En total désaccord** — **Indifférent** — **Tout à fait d'accord**				
• **Décisions concernant : La gamme de produits et les prix**					
- **Introduire un nouveau produit ou service**	☐	☐	☐	☐	☐
- **Interrompre un produit ou se retirer d'un marché**	☐	☐	☐	☐	☐
- **Revoir les prix de produits ou services existants**	☐	☐	☐	☐	☐
• **Décisions concernant : les relations clients**					
- **Ouvrir et démarrer une nouvelle usine ou installation**	☐	☐	☐	☐	☐
- **Développer des opérations pour entrer dans un nouveau marché**	☐	☐	☐	☐	☐
• **Décisions concernant : Sélection et relations avec les fournisseurs**					
- **Choix des fournisseurs**	☐	☐	☐	☐	☐
- **Abandon des fournisseurs**	☐	☐	☐	☐	☐
• **Décisions concernant : la conception et le développement de produits**					
- **Revoir la conception des produits**	☐	☐	☐	☐	☐
- **Améliorer les processus de production**	☐	☐	☐	☐	☐
- **Investir dans la technologie flexible**	☐	☐	☐	☐	☐
• **Autres décisions stratégiques**					
- **Acquérir ou fusionner avec une autre société**	☐	☐	☐	☐	☐
- **Changer la stratégie dans un département opérationnel**	☐	☐	☐	☐	☐

Section F: Informations demographiques

Votre poste de travail/titre: …… ……. , depuis combien de temps (années):

Votre age:
- ☐ 20 – 29
- ☐ 30 – 39
- ☐ 40 – 49
- ☐ 50 ou plus

Niveau d'education
- ☐ Licence
- ☐ Master
- ☐ Doctorat
- ☐ Diplôme professionnel

Votre expérience dans le domaine de la comptabilité et des finances (années)
- ☐ < 5
- ☐ 5 – 10
- ☐ 11 – 20
- ☐ > 20

Aimeriez-vous obtenir un résumé des résultats de cette recherche ? ☐ Oui ☐ Non

Si oui:

- Inclure votre carte de visite avec ce questionnaire au retour. Les détails des réponses resteront confidentiels et ne seront pas divulgués. Ou
- Envoyer une demande à cet e-mail : ferzizi@gmail.com

Je vous remercie pour votre collaboration.

Appendix N 3 : the study sample volume

Sample size calculator

What margin of error can you accept? 5% is a common choice	5 %	The margin of error is the amount of error that you can tolerate. If 90% of respondents answer *yes*, while 10% answer *no*, you may be able to tolerate a larger amount of error than if the respondents are split 50-50 or 45-55. Lower margin of error requires a larger sample size.
What confidence level do you need? Typical choices are 90%, 95%, or 99%	95 %	The confidence level is the amount of uncertainty you can tolerate. Suppose that you have 20 yes-no questions in your survey. With a confidence level of 95%, you would expect that for one of the questions (1 in 20), the percentage of people who answer *yes* would be more than the margin of error away from the true answer. The true answer is the percentage you would get if you exhaustively interviewed everyone. Higher confidence level requires a larger sample size.
What is the population size? If you don't know, use 20000	26744	How many people are there to choose your random sample from? The sample size doesn't change much for populations larger than 20,000.
What is the response distribution? Leave this as 50%	50 %	For each question, what do you expect the results will be? If the sample is skewed highly one way or the other,the population probably is, too. If you don't know, use 50%, which gives the largest sample size. See below under **More information** if this is confusing.
Your recommended sample size is	**379**	This is the minimum recommended size of your survey. If you create a sample of this many people and get responses from everyone, you're more likely to get a correct answer than you would from a large sample where only a small percentage of the sample responds to your survey.

Alternate scenarios

With a sample size of	100	200	300	With a confidence level of	90	95	99
Your margin of error would be	**9.78%**	**6.90%**	**5.63%**	Your sample size would need to be	**268**	**379**	**648**