

MINISTRY OF HIGH EDUCATION AND SCIENTIFIC RESEARCH

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**Implementation of Activity-Based Cost Management
(ABC/M) in a training institute
Case: TECHNOFORMAT Institute**

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ملخص

تعتبر المحاسبة التسييرية من أهم الأدوات التي يمتلكها المسير في عملية اتخاذ القرار، لهذا وجب أن تكون المعلومات التي تقدمها المحاسبة دقيقة وذات طابع مالي وغير مالي. من أجل هذا تم اختيار طريقة حديثة في احتساب التكاليف والتسيير وهي طريقة حساب التكاليف بالأنشطة والتي تؤدي لإمكانية تسيير المؤسسة بالأنشطة وذلك من خلال نظرة أفقية للمؤسسة. اختيار قطاع التكوين المهني جاء على أساس التحديات التي يواجهها سواء من خلال اشتداد المنافسة وارتفاع التكاليف أو من خلال التحولات التكنولوجية التي غيرت من طرق التعليم التقليدية وتستدعي تحسين الأنشطة ومسار الزبون.

كلمات المفتاح: التكاليف حسب الأنشطة – التسيير عن طريق الأنشطة – سلسلة القيمة

ABSTRACT

Managerial accounting is one of the most important tools that a decision maker has in his decision-making process. The information provided by the accounting should be accurate, financial and non-financial. For this purpose, a modern method of costs and management was chosen. This is the Activity-Based Costing, which leads to the possibility of managing the organization through activities with a horizontal vision.

The choice of the professional training sector was based on its facing challenges, whether about increased competition and rising costs or about technological transformations that changed traditional methods of learning and necessitate improvement of activities and customer process.

Key words: Activity-Based Costing ABC–Activity-Based Management ABM –Value Chain

RÉSUMÉ

La comptabilité de gestion est un des outils très important qui aide le manager dans le processus de prise de décision, de sorte que l'information fournie par la comptabilité doit être précise, qu'elle soit financière ou non financière. A cette fin, une méthode moderne de calcul des coûts et de gestion a été choisie : c'est la méthode de calcul des coûts à base d'activités qui conduit à la possibilité de gérer par activités à travers une vision horizontale de l'organisation.

Le choix du secteur de la formation professionnelle reposait sur les défis auxquels il est confronté, soit la concurrence accrue et des coûts croissants, soit les transformations technologiques qui ont modifié les méthodes traditionnelles d'enseignement et nécessitent une amélioration des activités et le processus client.

Mots clés : Coût à base d'activité ABC – La gestion par activités ABM – Chaine de valeur –

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CHAPTER I : INTRODUCTION

1 – Background

In a competitive environment, producing the best product with a high quality, which can attract customers and push them to buy, is the primary aim for any company hoping to remain competitive in today's challenging business environment.

In pursuit of this objective, organizations need to develop a successful global strategy based on a market research that determines the characteristics of the demand, the final product, customer's behavior, the marketing strategy and the human resources needs.

However, is it sufficient to make a profit? Is it enough to be efficient and performing?

Usually, the prices in the market are determining by one of these three ways: the competition, the demand and the cost of the product. Companies do not have any effect to influence competition prices and the quantity of the demand because it is determined in the market. Contrariwise, they have the cost as an inner factor that can be controlled reduced.

Any company wishing to control costs needs to rethink its organizational processes and install an effective system that allows collecting all information about the composition of the product global cost in order to determine the profit of each product apart. Even though the company makes a big profit, it is not necessary that is due to all products, it might have some profitable products and the others are not profitable or less profitable.

This system helps managers to make decisions concerning each product to improve the global profit of the company, this system called Managerial accounting.

The Managerial accounting allows managers to plan, manage and control their operations by using the financial information recorded by managerial accountants in their decisions.

The cost of any product or service contains a direct cost and indirect cost, the first one is easy to attribute to a specific product as wages of operational workers. Nevertheless, it is not easy to attribute an indirect cost as wages of the administrative functions; we can use for that a traditional costing method that divides the company into many functions and using a cost-driver with a causal link to the cost as the labor hours or machine hours.

However, when the production process is complicated and there is a lot of interaction between the deferent functions, it becomes difficult to choose the better cost-driver and the operation of attribution can be distorted, especially when it comes to a big company with a huge overhead cost.

Every function in a company has a set of activities, if we change the vision from a vertical vision based on the organization chart to a horizontal vision based on the process, we will find a number of orderly activities, and each of them has an adding value to the product until arriving at the final product.

Hence, we can divide the company into a number of activities and then, we determine the cost-driver appropriate for each activity. This method is called Activity Based Costing (ABC); it allows determining the price cost of each product more accurately.

Moreover, if we use this method we can identify the adding value of each activity, which gives the managers the possibility to eliminate the non-adding-valued activities or manage them better to have fewer cost products and obtains a competitive advantage compared to their competitors. This method called Activity Based Management (ABM); it is an extension of ABC.

Activity-Based Management can be applied in the service sector, which provides services to customers after a process of activities that allows understanding the system and hence improving the global performance and the individual performance.

We can find ABM in different service companies; we find it in banks, insurance companies, hospitals, companies of transport, hotels and telecommunication.

An important number of researches were done in these companies, but there is another subsector that did not get as much of studies concerning the application of Activity-Based Cost Management system, it is the sector of training. During our research, we did not find any previous study concerning ABCM Approach in a private training school.

2 – Thesis question and hypothesis

Through this work, we try to check the possibility of implementing an ABCM system in an institute of training and to understand how to proceed to divide the company into activities in order to overcome costs and be more competitive. We will look the possibility of taking some improvement actions to enhance the process of training in order to improve the performance of the institute.

In these regards, this research will attempt to address the following research question:

How to implement the Activity-Based Cost Management approach in an institute of training?

This question contains other under questions that help to answer the main question:

1. How to identify institute activities?
2. What is the result and benefit of applying ABC approach?
3. How to identify processes and value chain of the institute?
4. What is the result and benefit of applying ABM approach?

That supposes a number of hypotheses that can orientate the research:

1. The identification of activities requires analyzing the organizational chart and the organizational manual to pick up departments' activities.
2. Within ABC approach, we obtain the cost of each activity and then we can allocate more accurately costs to the right services using cost-drivers. We can know the result of each service apart.
3. The identification of processes needs analyzing the difference between services (trainings) to pick up the critical activities that represent the primary activities, and the rest of activities are considered as support activities.
4. The use of Activity-Based Management allows improving the process to reduce cost and win customer satisfaction.

3 - Thesis outline

To proceed to answer these questions and to approve these hypotheses, we start in chapter one by explaining the background of this field, précising the main question secondary questions and hypothesis. We highlight also the importance of this study and we explain the methodology, organization and limits.

In the second chapter, we present an overview of the managerial accounting by giving definitions of the most important words concerning this topic before giving the detailed definition of the managerial accounting. This leads us knowing the ABC and ABM, their principals, their steps and we try, also, to present the difference between ABC, and ABM, that helps to understand that ABM is just an extension of ABC.

The third chapter is a literature review of the Activity-Based Cost Management, in which we analyze previous of research in this field. It is useful also to look at previous study concerning ABCM approach in small companies, organization services, and education industry.

In the fourth and last chapter, we will make a presentation of the institute in which we will implement this method and we describe the different departments of the institute that help us to determine the activities and the process of training from the beginning to the end of the operation of training. In a second part, and after pricing results with ABC approach, we try to implement ABM by following orderly the steps of implementation from the dividing of the company to the determination of results by showing the potentials to the managers to improve the process and eliminate the non-valued activities.

We finish our work by a conclusion in which we provide answers to the research questions and we give some recommendations to the institute and then, open perspective to future research.

4 – Thesis objective

Two different objectives are aimed by this thesis; a professional objective concerning challenges that face professional training institutes, and an academic objective concerning the managerial accounting; it is to enrich the research in this field that does not interest students in management field although its importance.

In the context of Algeria, Schools and institutes of the professional training sector face a double challenge; Firstly, the digital age and the information and communication technology revolutionize the world of training. Secondly, the competition and increasing costs prevent development of schools. An approach of ABCM seems as a useful solution for this double challenge, it allows to enhance the process of training by the integration of new technologies of learning (E-learning) that allows also reducing costs by eliminating a number of activities.

One regards to the academic objective, contrarily to the Financial Accounting the Managerial Accounting is not mandatory by law in Algeria that is why companies look at it as additional costs and rare companies that use it, and then the number of studies is limited. However, it does not mean that the managerial accounting is not useful; the objective of this research is to highlight the importance of managerial accounting.

The lack of studies in managerial accounting in Algeria is matched by a lack of studies in ABCM in the field of the education industry.

5- Scope and limits

The scope of this thesis is limited to a managerial accounting perspective; therefore some aspects of the institute are not addressed, external constraints as competition, legal environment and non-financial information and others factors are not taken into consideration.

It is important also, to notice that the result of this research is limited to the context of this institute, so it is not suitable to generalize the results.

6 – Research methodology

To achieve the objective of this study, we have firstly, to analyze tasks and activities in the institute and secondly to interpret the financial information.

For this, it seems that the quantitative approach is more appropriate for the accounting side of our study. The case study explains and analyzes the financial information, costs, revenue and auxiliary information in order to find out detailed results.

The qualitative approach is also, used to gather nonfinancial information, it combines three types of qualitative data collection:

- 1 – Interviews (structured in which a set of questions is predetermined).
- 2 – Observation that involved the researcher taken note while observing the behavior and activities of individuals. The observation consolidates and completes the answers received from interviewees.
- 3 – Administrative documents as law of business (law for IFU) or private document as report and manual of organization

Indeed, this thesis is a case study that combines between the two approaches; quantitative and qualitative. It is a mixed method design.

In this thesis, there are three research methodologies, it is concerned the archival, empirical, and analytical, they are used to develop and analyze the information presented in this research.

6.1. Archival Research

For a sake of covering and detailing the literature review of the topic, the archival research was conducted in order to analyze different subjects around the topic: the managerial accounting, the activity-based costing and activity based-management, and the analysis of activities through the value chain.

The sources of the information for each subject are detailed below:

- ✓ Books: Managerial accounting, Business process management and activity-based costing were the title of books used in this research.
- ✓ Scientific articles: More than 16 articles on the topic of the literature review of ABC, ABM and the different uses of them.
- ✓ Thesis: three theses including two of the degree of doctor in the fields of ABCM.
- ✓ Others sources: encyclopedia and websites.

6.2. Empirical Research

Empirical research was based on data gathering from the different departments of the institute and interviews with managers and operational employees.

By the reason of the limited number of staff and the accessibility to information, the interviews were done with all the employees of the institute. They involved the first responsible General Director, Studies and training department responsible, general administration, Research and development department responsible, Accountant, financial, Marketing service, program development service, schooling, reception, general organization service, permanent teacher and five others trainers.

The interviews were done directly in face to face with the concerned and the principal questions were about the daily activities, the classification of activities (main and support activities), the time devoted for each activity, the organization of work and the process, the difference between trainings, fields, and process.

6.3. Analytical research

Regarding the analytical research, the goal was essentially to analyze, understand the financial information of the institute and to develop the use of an Activity-Based approach in accounting and in management. The revenue, the number of trainees and trainers, the number of activities and the analysis of cost structure of the institute were the basic data in which the research need to accomplish. The objective is to explain the financial difference between fields and use it in making-decision about improving or reducing some training and to modify the process of different types of trainings.

7 - Thesis organization

This thesis has four chapters. The chapter one is an introductory chapter, it discusses the research question and hypothesis, research methodologies utilized and the organization of the thesis. The second chapter “Conceptual Framework” defines basic concepts around the subject and describes the principal of Activity-based costing, activity-based management and value-chain of activities. The third chapter “Literature review” is also an overview of previous research that treats the uses of ABC/M approach in the service sector and especially the uses of this approach in the education industry.

The logical continuation of the fourth chapter

The fourth chapter is a specific one, it is the biggest one and it has a logical continuation that needs to be detailed in a way of facilitating the follow-up of the points treated:

1 – Firstly, and after the general presentation of the institute, it heads towards directly the information about the revenue and the number of trainees to highlight the existing difference between the revenue and the number of trainees. It means that the number of trainees does not mean automatically that the fields belonging the big number of trainees are the more profitable one. More than that, the revenue also does not mean the profitability; we need to calculate the cost of each field between the eight fields existing in TECHNOFORMAT.

2- Secondly, the direct cost is easy to be attributed to fields, but the overhead (indirect cost) needs to apply a method for this, we use Activity Based Costing. The first step is to identify all activities at the institute and determining the resource-driver and cost-driver. The second step is to gather activities that have the same cost-driver in centers of activities and then calculate the cost of each activity to determine the unit cost for each center of activities.

3- Thirdly, we determine the result of each field apart. Some fields have a beneficial; others are in deficit and others with an insignificant result.

4 – Fourthly, to reduce cost or to improve performance we need to manage the activities by using Activity-Based Management method. We classify the activities on a primary and support activities by using the value chain and finally we propose solutions of improving added-value activities and solutions to reduce or eliminate non-added-value activities.

CHAPTER II: CONCEPTUAL FRAMEWORK

This chapter provides conceptual distinctions and organizes ideas around the topic. A large number of concepts and definitions must be fixed before starting the literature review and the case study about applying ABC/M approach at the institute.

For a better understanding, and for a logical continuation, the beginning will be by a simple definition of important concepts, and then moving on to the managerial accounting, Activity-Based Costing, Activity-Based Management and Value Chain that surround the topic.

Concepts and basic definitions are extracted from different books in accountancy and management and from dictionaries and glossaries of Management:

1. Basic concepts

1.1. Business Process Management (BPM): There are several definitions of BPM, from different authors; we advance here only one definition that looks more simple and easy to understand, “BPM consists of a set of activities that are performed in coordination in an organizational and technical environment. These activities jointly realize a business goal. Each business process is enacted by a single organization, but it may interact with business processes performed by other organizations (Mathias WESKE, 2012, page 5).

1.2. Process: The process is series of activities that are linked to perform a specific objective. (The CAM-I Glossary of Activity-Based Management, page 9).

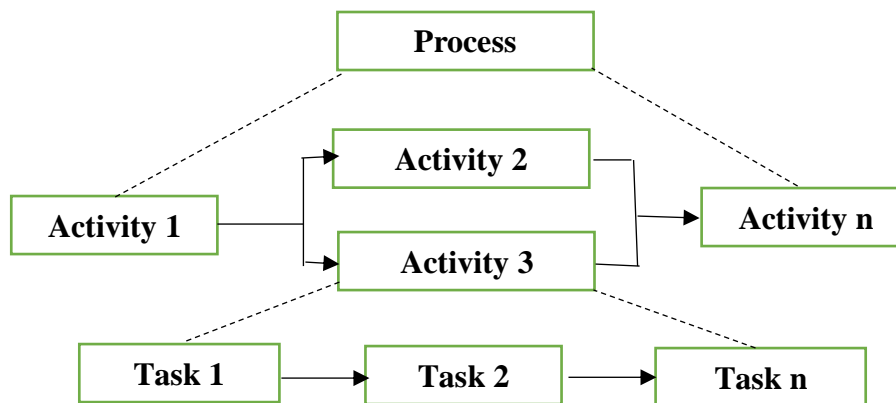
1.3. Task: The breakdown of the work in an activity into smaller elements (Tony Adkins, 2006, page 20).

1.4. Activity: The aggregations of actions performed within an organization that are useful for activity-Based Costing purposes (The CAM-I Glossary of Activity Based Management, page 1).

According to Marlos Dumas, Marcello La Roza, Jan Mendling and Hajo A. Reijers (2013, page 3) and to make Clear the difference between task, activity and process. When an activity is rather simple and can be seen as one single unit of work, we can call it task.

The following figure cleared the difference between task, activity and process:

Figure 2.1: Process, Activity and Task



Source: www.chambers.com

Given the importance of the concept of activity and the use of this term in this study, we provide more details around this concept; Activity code, Activity Cost, Activity duration and Activity list are definitions extracted from the book of Adedeji B. Badiru (2008, page 381).

- 1.4.1. Activity code:** One or more numerical or text values that identify characteristics of the work or in some way categorize the schedule activity that allows filtering and ordering of activities within reports.
- 1.4.2. Activity cost estimates:** The process of estimating the number of work periods that will be needed to complete individual schedule activities.
- 1.4.3. Activity duration:** The time in calendar units between the start and finish of a schedule activity.
- 1.4.4. Activity list:** A documented tabulation of schedule activities that shows the activity description, activity identifier, and a sufficiently detailed scope of work description so project team members understand what work is to be performed.

We add here the definition of the PMBOK (2012, page 178) in its fifth edition “The activity list is a comprehensive list that includes all schedule activities required on the project. The activity list also includes the activity identifier and a scope of work description for each activity in sufficient detail to ensure that project team members understand what work is required to be completed”.

- 1.5. Resources:** Economic elements applied or used in the performance of activities or to directly support costs objects. They include people, materials, supplies, equipment, technologies, and facilities (Tony Adkins, 2006).
- 1.6. Resource-driver:** The best single quantitative measure of the frequency and intensity of demands placed on a resource by other resources, activities, or cost objects. It is used to assign resource costs to activities, and cost objects, or to other resources (Tony Adkins, 2006).
- 1.7. Cost:** According to Larry M. Walthe, Christopher J. Skousen (2009, page 17), the cost accounting can be defined as the collection, assignment and interpretation of cost. As the concept of activity, the concept of cost needs to be more detailed, the following definitions are according to Tony Adkins, (2006).
- 1.7.1. Cost center:** A subunit in an organization that is responsible for costs.
- 1.7.2. Cost driver:** Any situation or event causes a change in the consumption of a resource or influences quality or cycle time. An activity may have multiple cost drivers. Cost drivers do not necessarily need to be quantified; however, they strongly influence the selection and magnitude of resource drivers and activity drivers.
- 1.7.3. Cost object:** Any product, service, customer, contract, project, process, or other work unit for which a separate cost measurement is desired.
- 1.7.4. Direct cost:** A cost that can be directly traced to a cost object because a direct or repeatable cause-and-effect relationship exists. A direct cost uses a direct assignment or cost causal relationship to transfer costs.
- 1.7.5. Indirect cost (overhead costs):** A resource or activity cost that cannot be directly traced to a final cost object since no direct or repeatable cause-and-effect relationship exists.
- 1.8. Adding-value/ Non-adding-value:** Assessing the relative value of activities according to how they contribute to customer value or to meeting an organization's needs. The degree of contribution reflects the influence of an activity's cost driver(s).
- 1.9. Value Analysis:** A method to determine how features of a product or service relate to cost, functionality, appeal, and utility to a customer (i.e., engineering value analysis).
- 1.10. Value Chain Analysis:** A method to identify all the elements in the linkage of activities a firm relies on to secure the necessary materials and services, starting from

their point of origin, to manufacture, and to distribute their products and services to an end user.

- 1.11. Continuing education:** Education beyond the traditional period of formal education. Organized instruction for part-time students. The term has also been used synonymously with adult education; evening and weekend programs offered to adults; continuing professional education; extension; university outreach and public service programming; lifelong education; and nontraditional study. Educational programs that take place after formal education has been completed, usually focused on improving skills and knowledge for specific occupations or professions. These programs sometimes provide evidence of successful completion, which participants can use to justify an improvement in salary or job classification (Jhon Collins and Nancy Patricia O'brien, 2003, page77).
- 1.12. Educational stakeholders:** An educational stakeholder is any person or organization that is involved with, participates in, or is affected by the educational process. In a given community an educational stakeholder could be a parent, business leader, community member, school board member or regent, student, or any member of the school district, college/university, or public or private educational agency, (Jhon Collins and Nancy Patricia O'brien, 2003, page 132).
- 1.13. E-learning:** A learning system that uses electronic mediums (e.g., cable TV, the Internet, or palm-held computers) for human learning. Historically, the first learning system can be called S-learning, using speech as its primary medium to promote learning. Its prominence was gradually replaced by P-learning, the second learning system that uses paper as its primary learning medium. However, E-learning became a pervasive and important learning phenomenon in the 1990s. It has various forms (e.g., virtual learning, online learning, distance learning, and Web-based learning) and involves various components (e.g., e-book, e-library, e-test, and e-classroom). (Jhon Collins and Nancy Patricia O'brien, 2003, page 133).
- 1.14. Internship:** A period of supervised practice following the completion of a specified program to facilitate the application of theory to practice. The internship provides the intern socialization into the profession and an opportunity to develop his or her practice including strategies such as classroom management. (Jhon Collins and Nancy Patricia O'brien, 2003, page 200).

2. Managerial Accounting

2.1. Definition: Management accounting is the process of preparing management reports and accounts that provide accurate and timely financial and statistical information to managers to make short-term and long-term decisions. It identifies measures, analyzes, interprets, and communicates information to enable an organization to pursue its goals (Arvind Rongala, 2015).

According to Brigitte Doriath, Michel Lozato, Paula Mendes and Pascal Nicolle (2010, p.251) the managerial accounting is interested in the internal flows of an organization in order to:

- Calculate and explain costs, margins and result by product or service.
- Make a comparison between the planned and the realized

The managerial accounting that is not subject to any form, use the expenses of financial accounting and analysis them.

In 2008, the Institute of Management Accountants (IMA) published a new Statement on Management Accounting (SMA) titled Definition of Management Accounting. It provides new definition reflects the increasingly strategic role of the management accounting profession: *“Management accounting is a profession that involves partnering in management decision making, devising planning and performance management systems, and providing expertise in financial reporting and control to assist management in the formulation and implementation of an organization’s strategy.”*

2.2. Financial Accounting and Managerial Accounting:

It is obvious that the Managerial accounting uses the information given by the financial accounting to produce more detail information. The information provided by the Managerial accounting concerns the inside of the organization and it is somehow a confidential information. The following table shows other points that make the difference between the two accountancies:

Table 2.1: Comparison of Financial and Managerial Accounting

	Managerial Accounting	Financial Accounting
Users	Inside the organization	Outside the organization
Accounting rules	None	U.S. Generally Accepted Accounting Principles (U.S. GAAP)
Time horizon	Future projections (sometimes historical if in detail)	Historical information
Level of detail	Often presents segments of an organization (e.g., products, divisions, departments)	Presents overall company information in accordance with U.S. GAAP
Performance Measures	Financial and Nonfinancial	Primary Financial

Source: Bob Livingston, 2012, page 11

In this table, we have the US GAAP Accounting principles. In Algeria, we have SCF (System of accounting and finance).

2.3. The Data source in Managerial Accounting:

In fact, the Financial Accounting is not the only source of information that uses the managerial accounting, there is also an operational data, Gary Cokins (2001, page 35) noted that:

2.3.1. Financial Data: The revenue and expenses per year, the salaries per department, taxes, acquisitions and depreciation, and a lot of others financial information are registered in legal books as well as in an accountant software by which they are available to use for analyzing operations for more details about the components of costs and results.

2.3.2. Operational Data are nonfinancial. This information is measurable in the form of units such as hours, number of activities, number of trainees or trainers, process of training. These are units of inputs or outputs that are consumed in making and delivering a product or service. Operational data are combined with financial data to produce cost data.

3. Activity-Based Costing

3.1. Background:

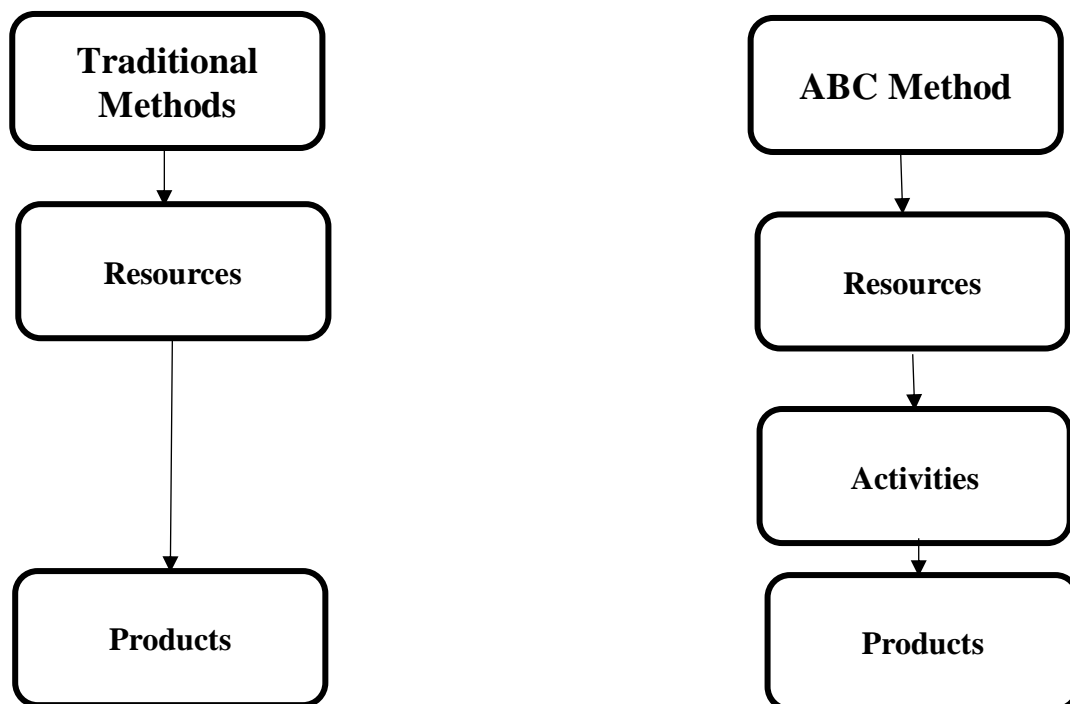
In response to the criticisms of traditional methods of calculating costs, the Consortium for Advanced Management International CAM-I established in 1986, cost and management research program entitled *Cost Management System*. This program emphasizes the fact that it is not the products consume the resources of the organization, but the processes and activities necessary for their implementation.

One of CAMI's conclusions is that it seems better to split the organization into processes and activities rather than functions or products. This transversal approach is based on Michael Porter's value chain concept (Thierry Jacquot and Richard Milkoff, 2007, page 237).

ABC is an innovative method that arrive at the end of the 1990s and which has since suffered a strategy of differentiation. It has a marketing logic that governs emergence, diffusion, and evolution of this method (Zelinschi Dragoş, 2010).

The following figure shows the innovative addition of this method:

Figure 2.2: Comparison between traditional method and ABC method



Sources: Thierry Jacquot and Richard Milkoff, 2007, page 237

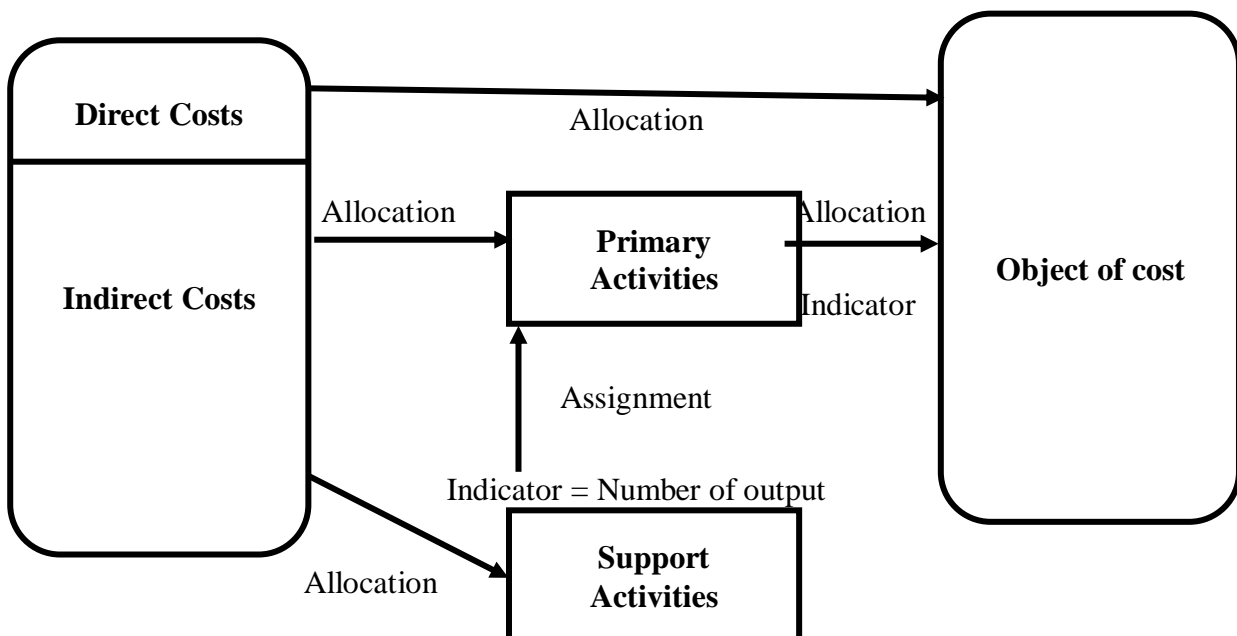
Between resources and products, we have activities that consume resources; these activities will help to an accurate allocation of costs to products or services.

3.2. Design and implementation of ABC: The main purpose of ABC is that assigns costs to products by tracing expenses to activities. In other words, products or services consume resources by using different activities that reflect as much as possible the physical dynamics of the business.

The allocation of cost to activities helps to identify cost drivers that facilitate sharing the overhead costs between products and services (object of cost) as it explained in the figure 2.3 that follow.

For this purpose, the implementation of ABC is different from organization to another; everything depends on the nature of the business, the process of production, environment, the objective of the organization, the culture of the organization and other factors.

Figure 2.3: The Analysis network



Source : Brigitte Doriath, Michel Lozato, Paula Mendez, Pascal Nicolle, 2010, page 270

3.3. Steps of implementation:

Despite the specificity of each organization, but generally, there are common steps, which characterizes the implementation of ABC system (Ray H. Garrison, Eric W. Noreen and Peter C. Brewer, 2015):

1. Define activities, activity cost pools, and activity measures.
2. Assign overhead costs to activity cost pools.
3. Calculate activity rates.
4. Assign overhead costs to cost objects using the activity rates and activity measures.
5. Prepare management reports.

If we want to go into details and provide more explanation about the process of implantation we can build an ABC model with twelve steps proposed by David R.Arnsdorf, Robert A.Erickson and Monica J.Fox (1998, pages 19 to 25):

1. Provide an introductory seminar on ABC to the company.
2. Identify and define relevant activities.
3. Organize activities by activity center.
4. Identify major elements of cost.
5. Determine the relationship between activities and costs.
6. Identify activity drivers to assign costs to products.
7. Establish the cost-flow pattern and model design.
8. Review the findings with the company.
9. Gather the necessary data to drive the ABC model.
10. Review the model results, make adjustments, and develop company cost rates.
11. Load budget data for the forthcoming year into the model.
12. Help the company update and modify the model as required to reflect business strategy changes.

3.4. Advantages of ABC:

Activity-Based Costing has come up to fix the limits of classical costing methods, so all the limits of the classical methods solved by ABC are considered as advantages of ABC:

- ✓ More accurate cost information leads to better decisions.

- ✓ Increased knowledge of production activities leads to process improvement and reduced costs (Kurt Heisinger, 2009, P.110).
- ✓ ABC information adds analytic value to profit-oriented decisions (David Shelby Harrison and Larry N. Killough, 2006).

3.5. Favorable conditions for ABC: Bob Scarlett (2005, page 248) enumerate four conditions in which the use of ABC is useful:

- ✓ When production overheads are high relative to direct costs, particularly direct labour.
- ✓ Where there is great diversity in the product range.
- ✓ Where there is considerable diversity of overhead resource input to products.
- ✓ When consumption of overhead resources is not driven primarily by volume.

3.6. Limits of ABC:

The attractiveness and effectiveness of the method, does not necessarily mean that there are no disadvantages:

- ✓ The collection of accurate data from many activities and to store them may make ABC too costly
- ✓ Some costs are difficult to assign to a specific activity or cost object. (Susan Crosson and Belverd Needles, 2011, page 173)
- ✓ The complexity and complications to controlling costs after allocations
- ✓ ABC system can be costly to implement (Kurt Heisinger, 2009, P.110).
- ✓ Behavioral and organizational resistance.
- ✓ The interviewing and surveying process was time-consuming and costly.
- ✓ The data for the ABC model is subjective and difficult to validate.
- ✓ Most ABC models were local and did not provide an integrated view of the organization.
- ✓ The ABC model could not be easily updated to accommodate changing circumstances. (Kaplan and Anderson, 1998, P.16).

Except that ABC method does not allow reducing cost and improving the process, the other limits of ABC and ABM are the same because they have the same principals.

4. Activity-Based Management

Managing an organization consists in operating in terms of process and not anymore in terms of function - organization unit: efficiency must be focused not only on the final product but also on the entire company's processes, productive and non-productive, that contribute to the obtainment of the product or service. (Giuseppe Tardivo and Giulia Cordero Di Montezemolo, 2009)

4.1. Definition: Activity-based management (ABM) is an approach to managing an organization that identifies all major activities or tasks involved in making a product or service, determines the resources consumed by each of those activities and why the resources are used, and categorizes the activities as either adding value to a product or service or not adding value. (Susan Crosson and Belverd Needles, 2011, page 16).

As the same suggests, the principal of the ABC and ABM are very close, the steps of implementation are also almost identical, and they start by the identification of activities.

The difference starts after the identification of activities, ABC focus on the allocation of costs and ABM uses the Data of ABC and try to classify activities into value-adding activities and non-value-adding activities.

According to Susan Crosson and Belverd Needles, 2011, P.171) A value-adding activity is one that adds value to a product or service as perceived by the customer. In other words, if customers are willing to pay for the activity, it adds value to the product or service. Examples include designing the components of a new recliner, assembling the recliner.

A non-value-adding activity is one that adds cost to a product or service but does not increase its market value. Managers eliminate non-value-adding activities that are not essential to an organization and reduce the costs of those that are essential, such as legal services, management accounting. Managers can also reduce costs by outsourcing activities to another company.

4.2. Steps of ABM: According to Kurt Heisinger, 2009, P.114), there are three main steps:

- 1 – Identify activities required to complete products
- 2 – Determine whether activities are value-added or non-value-added
- 3 - Continuously improve the value-added activities and minimize or eliminate non-value-added activities.

The Institute of Management Accounting, 1998, add other steps. According to it, the first step in the step of planning in which, focus be on identifying the purpose, objectives and expectations for the implementation of ABM. IMA gives also details after the first step of identifying activities, we need to analyze the process, identify cost drivers, the definition of outputs and do the added analysis. Lastly, it is recommended to documenting results for preparing the decision-making.

4.3. Uses of ABM:

According to the Institute of Management Accountants, six uses of ABM:

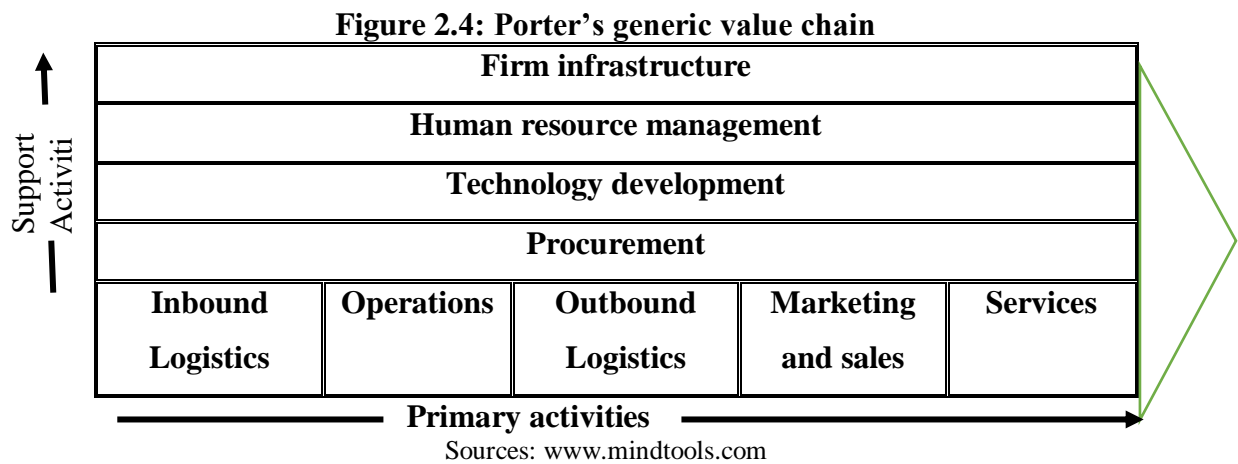
- 1 – Attribute Analysis: Classifies and combines cost and performance data into manageable, controllable clusters.
- 2 – Strategic Analysis: The objective is to create and sustain a competitive advantage and this to influence the future cost and improve profitability.
- 3 – Benchmarking: the objective is to identify a process or technique to increase the effectiveness or efficiency of an activity.
- 4 – Operations analysis / 5 – Pricing Analysis / 6 – Process improvement.

Isabelle Lacombe, (1997) adds the possibility of using ABM to evaluate the opportunity to outsource activities, activity-based budgeting, reengineering, or manage your operating financing needs.

5. Value Chain

- 5.1. Definition:** Michel Porter added the concept of value chains in 1985 in his famous book, *competitive advantage*. A value chain is a sequence of activities inside the organization, also known as primary processes that add value to a company's product or service; the value chain also includes support services, such as management accounting, that facilitate the primary processes. The sequence of primary processes in the value chain varies from company to company depending on a number of factors, including the size of the company and the types of products or services that it sells. (Susan Crosson and Belverd Needles, 2011, page 169).

The following figure shows the design of porter's value chain that makes the difference between primary activities and support activities:



5.2. Value chain and Competitive advantage:

In the project context to implement ABM, the value chain is useful to determine the value-added activities and the non-value-added activities. There are other advantages:

- ✓ Allows a company to focus on its core competencies. A **core competency** is a thing that a company does best.
- ✓ Gives a company an advantage over its competitors.
- ✓ Outsourcing activities. **Outsourcing** is the engagement of other companies to perform a process or service in the value chain that is not among an organization's core competencies. (Susan Crosson and Belverd Needles, 2011, page 13).

5.3. Value chain and Managers:

In today's competitive global business environment, analysis of the value chain is critical to most companies' survival. Managers must provide the highest value to customers at the lowest cost, and low cost often equates with the speed at which the primary processes of the value chain are executed. Time to market is very important. Managers must also make the services that support the primary processes as efficient as possible. These services are essential and cannot be eliminated, but because they do not add value to the final product, they must be implemented as economically as possible. Businesses have been making progress in this area.

Conclusion

Activity-based costing and activity-based management have not a small number of terms around them that need to be precise. It was very useful to explain all terms around the subject; it gives the opportunity to move on the next chapter with a number of definition that facilitate understanding the literature review.

**CHAPTER III: LITERATURE REVIEW
OF ACTIVITY-BASED COSTING AND
ACTIVITY-BASED MANAGEMENT**

This chapter discusses the literature review of Activity-Based Costing and Activity-Based Management approach, the application of them in organization service, in small companies and in the education industry.

In fact, it is common to find articles discussing the use of this approach in service organizations, but it is rare to find studies and articles that deal with ABC-M approach in the education industry, almost all articles and studies were about banks, insurances, telecommunication, hotels, transport, and hospitals.

1- Activity-Based Costing during the decade 2001-2011

Bülend Terzioğlu and Elsie S K Chan, (2013) found that manufacturing organizations was the primary and preferred sector for researches ABC research over the decade of 2001–2011. They also show that most of the papers published in academic and professional journals during 2001–2011 originate from the USA. Their study was included 183 articles on activity-based costing (ABC) from 32 academic and professional journals published during the period 2001 through 2011. They have found also that Surveys are the most widely used research method, followed by case studies.

2- From ABC to ABM

After the decade of 1990s, there had a need to a non-financial information that can use to manage the activities and improve processes. ABC system provides financial information about the accurate cost of products and services, but the existing of different ABC system to applying made the simplicity compromised, so ABC evolved from a process-cost allocation method or costing technique to a management philosophy under the acronyms of ABCM and ABM (Jones & Dugdale, 2002).

3- A successful ABC/M System

Grégory Wegmann and Nozile Stephen, (2010) write that the type of ABC used depends on firms' specificities. Ildikó Réka CARDOŞ and Ştefan PETE (2011) add that Successful implementation of ABC/ABM is not the same in every organization or follows the same path tailored to the unique strategy, structure, capabilities, and needs of the firm, ABC/ABM is a universally useful concept and system that can take on a multitude of shapes and uses.

Thanh Nguyet Phan, Kevin Baird and Bill Blair, (2014) insist on the step of development of an organization in which it is crucial in ascertaining the appropriateness of ABM practices.

Gregory Wegmann, (2010) emphasis on the strategic role of ABC that remains a good way to improve management accounting systems to drive strategic decisions.

ABC/ABM data should meet the needs of the company's decision-makers and support their efforts to create value for all stakeholders. Successful implementation of ABC and ABM requires the following issues to be considered:

- ✓ Managers should be fully conversant with the principles of ABC/ABM, to show commitment to the process, to advise on strategic and day-to-day operational problems of their organizations.
- ✓ Organize seminars, workshops and training concerning ABC/ABM implementation by universities, researchers and academics.
- ✓ Education, training and learning highlighting the principles, capabilities, goals and objectives of ABC/ABM for all employees.
- ✓ Analysis of critical activities and monitoring the process, ensuring the results of implementation are rolled out into effective decision-making.

These steps should be accompanied by three essential characteristics of a successful ABC implementation (Eric W. Noreen and Peter C. Brewer and Ray H. Garrison, 2011, P.239):

1. The support of top managers.
2. The evaluation and rewarding of employees should be based on the use of ABC data.
3. Creation of a cross-functional to design and implement ABC system.

4- Why Use ABC and ABM?

(Mohan Nair, 2000) A survey of 296 users of activity-based costing and activity-based management showed that the top four objectives of using ABC and ABM were as follows:

1. To provide product costing (58 percent)
2. To analyze processes (51 percent)
3. To evaluate performance (49 percent)
4. To assess profitability (38 percent)

All these objectives are important to most organizations and can be achieved with the help of ABC and ABM systems.

5- ABC/M Model in small companies

David R.Arnisdorf, Robert A.Erickson and Monica J.Fox (1998, page 62) examine the issues facing by small companies in order to apply ABC model, three recommendations are given for getting companies to make more complete use of the model's capabilities.

Firstly, the operational management personnel are not technical and very pressed for time; they are not sufficiently involved in the ABC model they need seminars and the Mid-Project Review to explain and involve them in the ABC Model and its uses in cost making-decision. Secondly, it is necessary to show the financial benefits for the upper managers to avoid the negligence of ABC project. Lastly, the issue of turnover can cause the project to lose focus.

Another point that concerns small company is the importance of applying the process of ABCM in all the company. According to Gunasekaran, Mcneil and Singh, (2000) the benefits of ABC and ABM can only be achieved if it is applied to the whole organization. Therefore, small companies should use activity-based analysis to identify non-value-added activities and then try to eliminate these activities by using the number of available management methods and techniques.

6- ABC/M in service organizations

With the economic development and the increase of competitiveness, the service sector is obliged to improve their efficiency by using modern ways of management. The augmentation of costs and especially the overhead costs push the organizations searching methods to know, manage and control their costs. In this context, a big number of studies were interested in the use of ABCM in service sector, Nara Medianeira Stefano and Nelson Casarotto Filho,(2013) have identified 21 articles between 1990 and 2011 that deal with the issue or service organizations and the use of ABCM approach, the majority (8 articles) concerned the organizations that provide health services.

In fact, there is 75 percent of companies that use ABC are in the public sector, service industry or a consulting industry (Mohan Nair, 2000). The use of ABC and ABM is not limited to manufacturing companies, all organizations, including service, nonprofit, retail and governmental can benefit from implementing some form of ABC and ABM (Kurt Heisinger, 2009, P.118).

Isabelle Lacombe (1997), argued the suitability of ABCM approach with the service sector by showing experiences in different types of the service sector; banks, insurance companies, telecommunication, hotels, hospitals, transports and public services were fields for experiences and validate the applicability of the system ABCM in this sector. Experiences concerned not only whole organizations but also, departments apart in organizations as the departments of purchasing, Marketing and research and development.

As part of these experiences, some points were noted:

- ✓ Services are intangibles and so difficult to inductors and activities enable to explain a service.
- ✓ ABC is not just a method of allocating costs to products, it allows real cost management through the understanding of activities.
- ✓ Information system represents a problem while setting ABC system, the available information is sometimes insufficient.
- ✓ It is difficult to estimate time used by an employee in specific activities, the proposed solutions are to approximate the time spent using standards based on typical days or weeks.
- ✓ It is not easy to identify activities in the research and development services.

7- ABC/M in education industry

According to our research, it is rare to find experiences concerning ABCM system in the education industry. We will be satisfied by showing only two experiences founded in this topic:

The experience of Jackson state university

In the case of Jackson University, the difficulty resides in the fact that it was a nonprofit organization, which make the implementation of ABC system expensive. The second was in the variety of their product lines (e.g., arts, humanities, engineering, sciences, and business), multiple services (research, teaching, administrative support), and multiple types of costumers (e.g., a physics major requires very different resources from an early-child-education major) (Kaplan and Anderson, 2007, P.190).

Public universities in Malaysia

The second experience discusses the implementation of Activity-Based Costing in higher education institutions (Noor Azizi, 2010), it recommends using SAS ABM software that can result in improved information of benefits to the university administrators. However, several obstacles and challenges especially those relating to supporting information systems may hamper the success of ABM system implementation.

SAS Activity-Based Management is an analytic application that models business processes to determine cost, profitability and drivers. With this solution, organizations can make informed decisions that streamline processes, deliver revenue growth and reduce costs across the organization.

8- Which to do first, ABC or ABM?

The debate over the relationship between ABC and ABM is very large, are they the same? If not, are they very different? If not, what are the commonalities and the points of divergence?

According to the Institute of Management Accountants, (1998), the key differences between ABC and ABM are:

- ✓ ABC focuses on understanding costs and their drivers; ABM seeks to change them;
- ✓ ABC can provide information on the process, product, and market performance; ABM finds ways to improve them;
- ✓ ABC is cost centered; ABM lies at the heart of the management process;
- ✓ ABC is the result of a static analysis of the organization; ABM is embedded in the dynamics of change;
- ✓ ABC is predominantly historical and focused on controlling existing costs; ABM is forward-looking, seeking ways to avoid unnecessary costs and put existing resources to maximum use;
- ✓ ABC reports on internal operational and tactical results; ABM is strategic, focused on understanding the key elements of value from the customer's perspective;
- ✓ ABC is a source of explanatory data; and ABM provides actionable information.

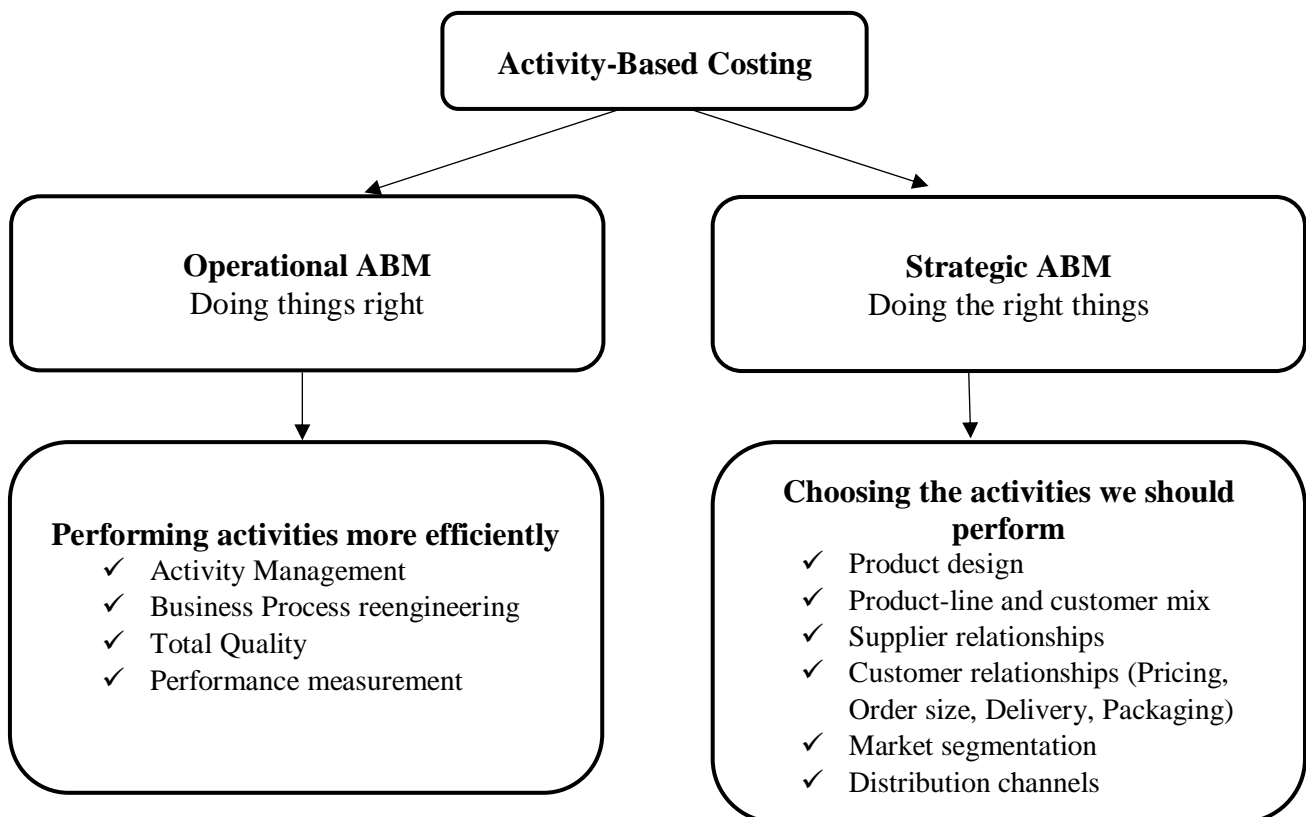
- ✓ ABC provides accurate cost information and ABM uses this information to initiate improvements. ABC systems produce a large amount of information that is used by the ABM (A. Gunasekaran, R. Mcneil and D. Singh, 2000)

Peter Armstrong, (2001) emphasis on the realist ontology of ABC that take part of the development of ABM, the activities identified for the purpose of cost allocation could be pressed into service as performance indicators. Guisepe Tardivo and Giulia Cordero Di Montezemolo, (2009) add that the Activity Based Management encourages a 'management by processes approach', that is considered the most efficient for emphasizing a total quality strategy,

ABC is a tool of ABM (Susan Crosson and Belverd Needles, 2011, page 173), Managers can use the cost information obtained from an ABC system to improve the efficiency and profitability of operations (Kurt Heisinger, 2009, P.114).

(Robert S. Kaplan and Robin Cooper, 1998, P 4) ABM accomplishes its objective through two complementary applications: operational and strategic ABM as shown in the figure below:

Figure 3.1: Using ABM for operational improvements and strategic decisions



Source: Kaplan and Cooper, 1998, P. 4

We finish this passage by Gary Cokins (2001, page 326) who expressed the difficulty to make the difference between ABC and ABM and which should follow the other, it preferable to suspend this debate and simply refers to ABC as using strategic cost information and ABM as tactical and operational actions planned.

9- The Future of Managerial accounting and ABC/M

In the digital age, there is a massive amount of information, the challenge that faces companies is to the deal with this information, According to Gary Cokins (2001, page 26), the companies that survive will be those that can answer the following questions:

How do we access all this information?

What do we do with it?

How do we shape the data and put them in a form with which we can work?

What will happen when we apply technologies developed during the information age for the information age?

The same author adds that there are two key myths about the requirements and the uses of managerial accounting, in which organizations should reflect on; firstly, all users of financial information will require the same type of information, and operational excellence will eventually trump the finance and information technology departments.

Noor Azizi, (2010) talked about the change that higher education will happen in the future, this requires a more effective cost management systems that are flexible and timely provide information critical to a better decisions, ABC/M approach represents one alternative tool for institutions. He also mentioned the importance of using SAS software to improve the conditions of gathering, analyzing and keeping information.

According to Bülend Terzioğlu and Elsie S K Chan, (2013), Future research should unravel the reasons underlying dwindling research interest in ABC. Given ongoing implementation problems, longitudinal rather than cross-sectional research is needed. Neither this nor previous reviews considered whether ABC research was primarily longitudinal or cross-sectional, so this is an obvious direction for future research.

Future literature studies could also document difficulties experienced by adopters of ABC or difficulties envisaged by non-adopters of ABC while examining successful applications of ABC.

Comparing accounts of successful and unsuccessful ABC implementations would provide insight into understanding the key hurdles and success strategies.

For a deeper understanding of the problems, more case study research is needed. The Continued dominance of surveys indicates that the topic has not yet reached maturity.

Conclusion

This chapter provides a deeper view of the activity-based cost management; the use of it in small companies, service organization, and education industry facilitate the lead off the case study in the institute that is a small company in a service sector.

CHAPTER IV
CASE STUDY: APPLYING ABC/M
APPROACH

1 - General presentation of the institute

The technologic institute of training TECHNOFORMAT is an Algerian institute recognized by the state (Ministry of Professional Training and Education) under the number 729/95 founded in 1995 (03/10/1995), with the legal form of a company with a limited responsibility (SARL) with a share capital of 1.7 Million of dinars. The head office is located in Rouiba.

Thanks to the quality of training, the institute helps companies to improve their performance, by providing qualified and competent human resources able to make the difference and participate in the development of companies.

The institute tries to act the part of a hyphen between the professional world and the training world by proposing a small and a professional training, which with the trainee can find easily a job without studying for many years at the university in an unemployable specialty and suffering of unemployment for many years.

A large number of students, being in the university, are not interested in the academic and scientific research; they only look for a job to make money. However, they are not sufficiently informed by the modification in the job market; now the recruitment is done by the number of skills that the employee has, and by his added value to the company, and not by the number of years spending at the university or the degree into the classification in the public service.

People who are looking directly for a job to starting their professional career have to choose a requested training, not necessarily for a long period but it opens for a pointed job.

For this, the institute provides trainings in eight fields:

- QHSE (Quality, Heath, Security and environment),
- Finance and accounting,
- Marketing and trade,
- Management of human resources,
- Production and logistic,
- Administration and Legal training,
- IT Training,

- Languages.

The institute currently has 128 trainers in these fields; 64 in HSE, 6 in accountancy and in marketing, 10 in human resources, 5 in production, 3 in administration, 13 in IT and 21 in languages (10 in French language, 9 in English language and 2 in Spanish language).

Except five (three in HSE, one in French language and one in English) those trainers aren't permanent, they provide courses occasionally according to the constitution of groups and the presence of need training from the companies.

These fields of trainings are organized in three types of training:

1 – Diploma Training (Long period Training): It concerns the kind of training that exceeds to one year until (30) thirty months, as: Technician Diploma (BT), senior technician Diploma (BTS), Certificate of professional Competence (CAP), the certificate of professional mastery (CMP).

Actually, there are only two groups in BTS in IT training field:

- 1- Web and multimedia developer.
- 2- Administration and security of computer networks.

2 – Certificate of qualification (Middle period training): This type of training is between (60) sixty hours to (270) two hundred and seventy hours of courses. It can be a blocked courses or alternatively until (9) nine months.

3 – Training certificate (Short period): Trainings under (60) sixty hours are considered as a short period training.

The institute has 23 years of experience in the education industry and enjoys a very good reputation among public and private companies. In the following table, we present 15 companies among tens that have trusted TECHNOFORMAT:

Table 4.1: fifteen large corporate clients

N°	Companies	Trademark	Fields of training	Years
1	Wataniya télécom	Ooredoo	HSE	Since 2013
2	SAIDAL and Sanofi / Groupement SAIDAL / Sanofi Aventis	Winthrop SAIDAL SANOFI	HSE / Accountacy	Since 2014
3	SIEMENS Spa	SIEMENS	HSE	Since 2012
4	HYDRO-AMENAGEMENT	/	HSE	Since 2010
5	Sonatrach-Total-Sepsa	Groupement TIMIMOUN	HSE	2013
6	Sonatrach-Anadarko	Groupement BERKINE	HSE	2014
7	SONATRACH	/	HSE	2016
8	Promasidor Al-Jazayer	Loya	HSE / IT	Since 2012
9	Agence National des Autoroutes	ANA	HSE	Since 2016
10	Taiba Food /Ramy food company	Ramy	HSE	Since 2014
11	Bab-ezouar University	USTHB	HSE	Since 2013
12	Agence Spaciale Algérienne	ASA	HSE	Since 2012
13	Centre National d'Etudes et Recherche en Urbanisme	CNERU – TIZI OUZOU	IT	Since 2013
14	ENAP	/	HSE	Since 2013
15	EPIC ASROUT	ASROUT	HSE	Since 2013

Source: Marketing service

2- Statistics analysis

A very large number of trainees in different fields have been trained since the creation of the institute. The next board provides the number of trainees by year and by specialty in the last decade:

Table 4.2: Number of trainees by fields at the last decade (2008-2017)

Year Fields	08	09	10	11	12	13	14	15	16	17	TOTAL	%
HSE	237	247	284	278	292	277	254	224	197	185	2475	42%
Finances accounting	32	39	35	27	34	15	12	16	/	11	221	4%
Marketing and trade	52	12	16	/	/	24	36	9	13	14	176	3%
H.R	24	44	38	13	36	/	/	12	23	19	209	4%
Production Logistic	/	/	12	7	/	/	16	31	/	19	85	1%
Admn. And legal	/	4	/	13	11	2	22	8	/	/	60	1%
IT	85	85	75	79	91	69	74	62	77	71	768	13%
Languages	121	221	186	193	174	191	206	189	196	202	1879	32%
TOTAL	551	652	646	610	638	578	620	551	506	521	5873	100%

Source: Schooling service

We notice that the field of HSE is the biggest one (42%) and the languages field is the second one with 32%. The two fields' represent 74% of the number of trainees, and the six others fields represent only 26%.

In order to have a clear view of the activities of the institute, we need to make a comparison between the revenue of each field of training:

Table 4.3: The percentage of revenue by fields in the three last year (2015-2017)

Year Fields	2015		2016		2017		TOTAL		%		%
	Companies	Particular trainees	Companies	Particular trainees	Companies	Particular trainees	Companies	Particular trainees	Companies	Particular trainees	
HSE	5 537 255,55	6 925 000,00	7 578 210,00	5 032 000,00	8 250 450,00	3 594 500,00	21 365 915,55	15 551 500,00	61%	70%	65%
Finances accounting	490 000,00	/	/	/	490 000,00	/	980 000,00	/	3%	0%	2%
Marketing and trade	/	472 000,00	/	625 000,00	/	674 500,00	/	1 771 500,00	0%	8%	3%
H.R	675 200,00	/	825 000,00	/	1 120 000,00	/	2 620 200,00	/	8%	0%	5%
Production Logistic	825 000,00	/	/	/	1 422 533,33	/	2 247 533,33	/	7%	0%	4%
Admin. And legal	354 200,00	/	/	/	/	/	354 200,00	/	1%	0%	1%
IT	3 624 333,33	423 200,00	2 945 850,00	741 000,00	665 600,00	549 821,00	7 235 783,33	1 714 021,00	20%	5%	15%
Languages	/	922 300,00	/	1 078 500,00	/	1 202 100,00	/	3 202 900,00	0%	14%	5%
SUBTOTAL	11 505 988,88	8 742 500,00	11 349 060,00	7 476 500,00	11 948 583,33	6 020 921,00	34 803 632,21	22 239 921,00	100%	100%	100%
TOTAL	20 248 488,88		18 825 560,00		17 969 504,33		57 043 553,21		/		

Source: Finance and accounting department

Firstly, and before analyzing, the division of the table into two categories (Particular and companies) is explained by the difference of the process existing between them, knowing that particulars mean free-trainees that pay for them-self the training cost, while the companies pay the training cost for their employees.

We notice that:

- In contrary of the first table (trainees by field) in which the languages field was in the second position with 32% of trainees, we find it among the weakest field's revenue with 5%.
- HSE stay the first field with 65% of the global revenue as it was in the number of trainees with 42%.
- Companies have 61% of the global revenue, and the rest is for particulars (39%).

From this information, we can conclude that the most important field in the institute is HSE, in which we have to give more importance in our analysis, and we notice that companies have also, a big importance with their revenue.

Even though all this information, it is difficult to determine which are profitable services and which are not. For this, we have to know the cost of each service (training) by using the analytical accountancy to determine the result.

The direct cost can be easily attributed to a specific product. Nevertheless, the indirect costs are difficult to attribute, they need to use a method in which the attribution of indirect costs would be the most relevant possible. We choose for this, the Activity-Based Costing ABC method that helps us to not only attribute indirect cost but also conduct us to manage the costs and activities by applying Activity-Based Management ABM.

It needs firstly, to understand the organization and the functioning of the institute by analyzing the organization chart and determining activities in every department. After that, we will obtain a list of activities in which we can determine the different process existing in the institute for a different kind of training.

The main objective is, firstly to identify all activities of the institute. Secondly, calculate the result of each field to get hold of information about which fields are most profitable (applying ABC method). Thirdly, to identify the different process of the institute to

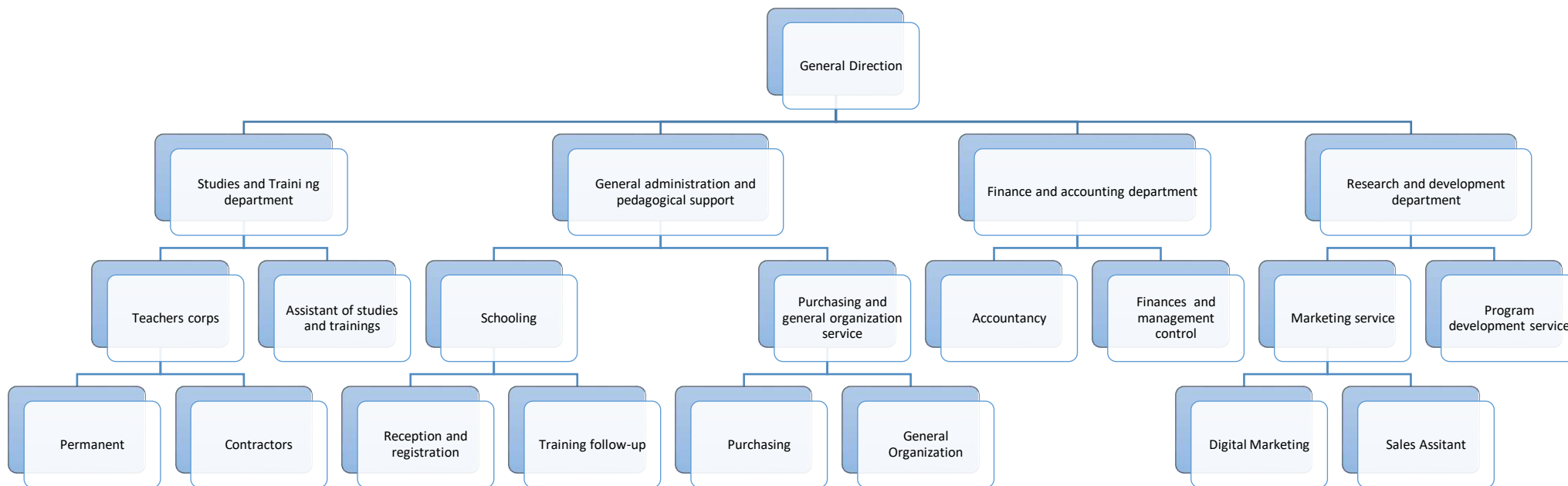
determine the chain value of activities and lastly, developing the Added-value activities and reducing or eliminating the non-added-value activities.

3- Organizational chart analysis

3.1. Organizational chart of TECHNIFORMAT

The total number of employees of TECHNIFORMAT reach to 22 employees with three contracts of pre-employment and five trainers. Those employees are distributed in four departments. The following figure shows them:

Figure 4.1: The Organizational chart of TECHNOFORMAT



Source: General Direction

The organizational chart of TECHNFORMAT shows the internal structure of the institute, the relationships, relative ranks of its parts and position, and determines the responsibilities. However, it is a vertical view of the organization. It does not allow making the different relationships between departments and it does not permit understanding the process of training in which the possibility of improvement becomes doable.

The top-down hierarchical structure known as a vertical organization has many disadvantages; for example, employees feel less valued than those higher up in the chain, and the decisions can take a great deal of time to filter down.

In the case of TECHNOFORMAT, this structure does not allow to evaluate the individual performance and represent disproportion of tasks between services hence the improvement of the process and the result of each service are impractical.

3.2. Activities and tasks analysis

To fix the problem of training performance evaluation, the passing from the vertical vision to a horizontal one is recommended; the analysis of tasks of every level and every workplace in the organizational chart allows the determination of all existing activities and gives the possibility to understand the consumption of resources by these activities and the trainings that use them.

The identification of activities is the first step of the activity-based costing ABC; it allows detailing tasks of every department and gives every activity an appropriate cost-driver to avoid using an inappropriate one for each department that contains a list of inhomogeneous activities.

Therefore, for identifying the activities of the institute, there is nothing better to use the manual organization of the institute to extract activities of the institute. The following table contains every job with the tasks attributed:

Table 4.4: Organizational Manual

Department	Tasks
General Direction	<ul style="list-style-type: none"> • Take strategic decisions as: new trainings, new partnership, new investments.... • Follow the activities of the others departments through periodic reports and meetings. • Represent the institute in different events. • Signature of diplomas, trainings offers, checks, financial transfers and all others administrative and financial documents. • Pre-interview with trainers, consultants and candidates employees and final decision to recruitment or dismissals. • Graduation ceremony.
Studies and trainings department	<ul style="list-style-type: none"> • Elaboration of annuals, half-yearly, quarterly and monthly training schedule of all trainings. • Preparation of the technical side of offers. • Ensure the well running of the courses. • Interview with new trainers. • Preparation of new programs and improvement of the actual programs in collaboration with trainers. • Launch of training groups in collaboration with the finance and accounting department and general administration department. • Attend meetings with companies' customers to negotiate the technical side in cooperation with the finance and accounting Director. • Preparation of periodic pedagogical report. • Contribution to the organization of educational events (seminars, conferences, guests and tutors, study trips, information of participants, reservation of conference rooms, etc.)
Reception and registration	<ul style="list-style-type: none"> • Answer all request of information to whether particular trainees or companies about all information. • Call transfer for all departments.

	<ul style="list-style-type: none"> • Form groups for all trainees and ensure communication with candidates. • First registration of trainees. • Send and receive by fax. • Recording of all movements into a register.
<p style="text-align: center;">General administration and pedagogic support</p>	<ul style="list-style-type: none"> • Writing of all administrative and organizational documents as: inner rules, contacts, bulletin board...etc. • Ensure the launch of training every morning. • Ensure the respect of the timetable and the duration of training. • Launch of training groups in collaboration with the finance and accounting department and general studies and training department. • Calculation the number of hours by field and by teacher and make the comparison between the planned and the realized. • Keep and organize files of employees (administrative staff and trainers) and the preparation of payslips using the software PC PAIE. • Trainees, trainers and staff insurance. • Signature of administrative documents as school certification.
<p style="text-align: center;">Schooling</p>	<ul style="list-style-type: none"> • Final registration of new trainers. • Preparation of all documents from begin to end of any training as: First list, training opening report, training closing report, school certificate, state of presence, letter for traineeship, certificate of qualification, viva document and report, school transcript...etc. • Post up in the notice board. • Periodic report of the progress of trainings.
<p style="text-align: center;">Purchasing service and general organization</p>	<ul style="list-style-type: none"> • Make all purchases. • Preparation and organization of coffee break and ceremonies. • Technical assistance in courses. • Care and maintenance of all equipment. • Care and maintenance of computer hardware and software.

	<ul style="list-style-type: none"> • Insure transport of equipment and trainers in case of outside trainings. • Reprography (reproduction of teaching aids as: burning DVD, Documents in paper format, notebook...etc. • Subcontracting serigraphy, car maintenance and others services. • Electronic and physical filing following instructions of General Administration instructions. • Caretaking and security of the institute. • Cleaning works.
Accountancy	<ul style="list-style-type: none"> • Keeping and updating legal books. • Periodic reports of the financial situation (incomes, debts, receivables, treasury...etc.) • Control of different payroll (staff and trainers) • Establish G50, Balance sheet, fiscal balance and all others fiscal documents. • Inputting accounting data by using the software PC COMPTA. • Physical inventory at the end of the year.
Finances and management control	<ul style="list-style-type: none"> • Periodic reports of performance (results, financial statistics, periodic comparison report, cost analysis...etc.) • Debt collections with companies. • Track of payment of trainees. • Preparation of the financial side of offers and participation in contract negotiation. • Invoicing and monitoring of suppliers and customers' files. • Balancing the cash and insuring the daily financial operations. • Organization of supporting document and accounting archive.
Marketing service	<ul style="list-style-type: none"> • Administration and updating of database, website, social networks and others advertising accounts. • Advertising of every new session or new training coordinating with the others departments. • Manage the relations with the agencies of communication and designers for the creation of advertising message.

	<ul style="list-style-type: none"> • The regional representatives are responsible for: <ul style="list-style-type: none"> - Prospecting and negotiating training contracts from its geographical area. - Direct marketing (delivery of advertising pack: flyers, business cards, posters, gadgets, gifts ... etc.) to companies, students, and public and private organizations and institutions.
Research and development	<ul style="list-style-type: none"> • Coordination with trainers and studies department to develop the actual programs. • Monitor the sociological and cultural changes of young people. • Monitoring the different business intelligence (Technology watch, environmental scanning, regulatory monitoring...etc.) • Creation of a network of relations with all the actors of the training field (State organization of vocational training, universities, research center ... etc.). • Working for national and international partnership. • Preparation and suggestion of improvement actions through reports in a periodic meetings opportunities.

Source: General direction

From this manual, we can get a clear view of all activities of the institutes by a department and that allows identifying the cost driver of every activity and then grouping together activities that have the same cost driver.

However, before this step, we need to know the resources consumed by each department and then attribute for each activity its cost (resources consumed).

4- Activities and costs analysis:

4.1. cost analysis:

We can identify costs by extracting them from the financial accountancy; all charges of the class number six according to its nature are saved in this class accounts. That allows attributing the exact amount of resources consumed by a department.

Known that the information and the date that we will use to analysis concerns the exercises of 2015, 2016 and 2017 years, the following table provides detail information by account and by department or service,

The selection of three years and not one year is explained by the fact of the nature of trainings, which can last 9 months. We estimate that the overlapping of exercises can be avoided by the extension of the study period:

Table 4.5: Costs and expenses by nature and by department

Source: Created from the Accounting and finance department's data

Department/Services	General Direction	Studies and trainings	Reception and registration	General Administration	Schooling	General organization	Accountancy	Finances	Marketing	Program development	TOTAL
60 Consumed purchases											
602 consumed purchases											
602100 Office Suppliers purchases	64 500,00	94 771,00	52 894,00	76 521,00	98 621,00	154 243,00	78 152,00	55 607,00	72 913,00	91 520,00	839 742,00
602200 Computer Suppliers purchases	23 651,00	32 564,00	34 250,00	22 500,00	26 451,00	85 261,00	34 614,00	29 654,00	65 128,00	22 509,00	376 582,00
602700 Pedagogic consumables purchases											
602900 Other purchases											0,00
607 Electricity,Gaz, Water	35 847,15	35 847,15	35 847,15	35 847,15	35 847,15	35 847,15	35 847,15	35 847,15	35 847,15	35 847,15	358 471,50
61 External services											
613 Tenancy											0,00
613100 Buildings	1 080 000,00	1 080 000,00	1 080 000,00	1 080 000,00	1 080 000,00	1 080 000,00	1 080 000,00	1 080 000,00	1 080 000,00	1 080 000,00	10 800 000,00
613200 seminair rooms											
615 maintenance and repairs	31 210,00	52 315,00	36 580,00	374 511,00	20 474,00	162 541,00	19 564,00	152 410,00	25 501,00	13 975,00	889 081,00
616 Insurance premium	29 518,00	29 518,00	29 518,00	29 518,00	29 518,00	54 110,00	29 518,00	29 518,00	29 518,00	29 518,00	319 772,00
62 Others external services											
622 intermediaries											
622000 Accounting fees	36 000,00	36 000,00	36 000,00	36 000,00	36 000,00	36 000,00	36 000,00	36 000,00	36 000,00	36 000,00	360 000,00
622200 Consultancy fees											
623 Advertising	36 213,15	36 213,15	36 213,15	36 213,15	36 213,15	36 213,15	36 213,15	36 213,15	36 213,15	36 213,15	362 131,50
624 Transport	122 153,00	32 123,00	0,00	31 241,00	0,00	42 151,00	5 400,00	0,00	21 238,00	19 542,00	273 848,00
625 Missions and receptions	42 100,00	15 421,00	0,00	11 419,00	0,00	6 451,00	0,00	0,00	29 571,00	25 456,00	130 418,00
625100 Travelling and accommodation expenses	115 422,00	131 001,00	0,00	42 130,00	0,00	0,00	0,00	0,00	21 992,00	41 257,00	351 802,00
625300 catering costs											
625900 Others	3 624,00	6 523,00	666,00	1 250,00	0,00	0,00	0,00	0,00	5 500,00	6 100,00	23 663,00
626 post and telecommunications costs	36 421,00	94 521,00	84 521,00	4 500,00	14 500,00	14 500,00	14 500,00	14 500,00	21 362,00	13 651,00	312 976,00
627 Bank charges	3 421,00	3 421,00	3 421,00	3 421,00	3 421,00	3 421,00	3 421,00	3 421,00	3 421,00	3 425,00	34 214,00
63 Staff costs	182 452,21	345 252,52	49 521,16	85 151,79	49 229,19	182 526,51	59 412,31	49 258,61	51 612,36	79 845,25	1 134 261,91
64 Taxes											
645100 TAP											0,00
645900 Others taxes	2 151,00	2 151,00	2 151,00	2 151,00	2 151,00	2 151,00	2 151,00	2 151,00	2 151,00	2 151,00	21 510,00
68 Depreciation and amortization	155 862,00	101 542,64	62 563,14	84 412,36	79 423,64	556 841,14	44 521,11	46 666,66	58 566,66	56 333,33	1 246 732,68
695 Profit tax	190 000,00	190 000,00	190 000,00	190 000,00	190 000,00	190 000,00	190 000,00	190 000,00	190 000,00	190 000,00	1 900 000,00
TOTAL	2 190 545,51	2 319 184,46	1 734 145,60	2 146 786,45	1 701 849,13	2 642 256,95	1 669 313,72	1 761 246,57	1 786 534,32	1 783 342,88	19 735 205,59

The boxes in yellow are left empty because they concern direct costs that can be allocated directly to a specific training;

1. : In most cases, it is possible to separate between fields training by a specific billing for a specific group in a specific day.
2. Trainers costs are allocated easily, each fee of course given is automatically oriented to the cost price of a specific field, except the permanent trainers.
3. Periodically, some rental expenses concern a specific seminar or training that given in a hotel or in another structure.
4. TAP: is a fixed tax, 2% from the incomes, we find out it from invoices.

Finally, we notice that the difficulty of departments and services cost attribution comes from some fees or cost that are consumed collectively, it took a deeper analysis in collaboration with the financial and accountancy department.

4.2. Activities and resource-driver:

After the description of activities and the determination of cost center (department), the next step is to identify and choose resource driver, which is an indicator to share costs of each costs center (department) between its activities.

The determination of cost driver is done based on the observation during the work experience and after series of interviews with employees in every department. The questions were focused on the progress of working and the daily activities.

The outcome of interviews and observation allow eliminating certain activities described in the organizational manual (table 4) that are considered as an insignificant.

The *number of hour per week* is the proposed resource driver which was mostly the common one that is shared by departments because, the activities are repetitive per week. A week in the institute starts by the opening of trainings every Sunday and closes on Thursday, without forgetting the week's trainings on the weekend, Saturday and Friday. We can call this cycle of training.

4.3 – Activities and cost-drivers:

In interviews, and according to our observation, we have proposed six (6) cost-drivers:

- 1- **Revenue**: it is not accurate but allows incurring cost in general activities as the activity of purchasing; we divide per 100 the incomes given in table 4.3.
- 2- **Numbers of trainees**: According to the table 2, the number of trainees, in the three last years is (1578) divided in the eight (8) fields, this cost driver is appropriate with activities that deal directly with trainees, as the activity of registration.
- 3- **Number of trainers**: there are 128 trainers divided in the eight fields.
- 4- **Number of trainings**: Every field contains a number of trainings, they may be long, middle or short period.
- 5- **Number of groups**: one training might have many groups during the year, the following table shows the difference between the two cost-drivers (number of trainings and the number of groups):

Table 4.6: Number of proposed, programmed trainings and the number of groups per period in last three years (2015-2017)

Field	Long period			Middle period			Short period			TOTAL		
	Prop Trai	Prog Trai.	Cur. Gro.	Prop trai	Prog Trai.	Cur. Gro.	Prop Trai.	Prog trai.	Cur. Gro.	Prop Trai	Prog Trai	Cur. Gro.
QHSE	/	/	/	7	5	15	16	11	97	23	16	112
Accounting	2	/	/	4	1	2	9	2	2	15	3	4
Trade	2	/	/	6	1	2	8	1	2	14	2	4
Human resources	1	/	/	28	1	1	6	1	2	34	2	3
Production	/	/	/	13	/	/	13	2	2	26	2	2
Administration	/	/	/	6	/	/	5	1	1	11	1	1
IT	5	2	2	2	/	/	25	19	29	32	21	31
Languages	/	/	/	/	/	/	6	3	86	6	3	86
TOTAL	10	2	2	66	8	20	88	40	221	164	50	243

Source: Created from the schooling department's data

Prop. Trai. : Proposed training means all trainings existing in the training catalog.

Prog. Trai. : Programmed training, all training in which there are groups.

Cur. Gro : Current groups, the groups by every training.

What matters to us are the two cost-drivers: number of trainings (programmed): 50, and the number of groups: 243.

- 6- **Number of companies:** Companies that have benefited from trainings of the institute in the last three years. According to the departments of studies and finance they are 158 companies in this three last year divided as follows: (114 in HSE, 20 in accountancy, 6 in Marketing, 4 in Human resources, 2 in production, 2 in administration, 6 in IT and 4 in languages).

The following table shows the number of hours per activity in each department and its percentage compared to the other ones, it contains also the proposal of cost drivers for each activity, it is estimate according the answers in interviews in addition to our observation:

Table 4.7: Duration of activities and their cost drivers

Department/ Service	Activity	Number of hour	%	Cost driver	
General Direction	A1	Appointments	10	25	Revenue
	A2	Inner meetings	10	25	Nbr. trainings
	A3	Preparation of meetings and agenda	7	17	Revenue
	A4	Representation of the institute	4	10	Revenue
	A5	Check and signature of diplomas	4	10	Nbr. trainees
	A6	Interview with trainers	4	10	Nbr. trainers
	A7	Graduation ceremony	1	3	Nbr. groups
Studies department	B1	Inner meetings	10	25	Nbr. trainings
	B2	Preparation of technical side of offers	7	17	Nbr. Companies
	B3	Interview with trainers	7	17	Nbr. trainers

	B4	Preparation of programs	5	13	Nbr. trainings
	B5	Preparation of reports	5	13	Nbr. trainings
	B6	Elaboration of schedules	4	10	Nbr. trainings
	B7	Negotiate technical side of contracts	2	5	Nbr. companies
	B8	Teaching	/	/	/
Reception	C1	Preparation of groups	15	37	Nbr. groups
	C2	Answer for information request	10	25	Nbr. trainings
	C3	First registration	8	20	Nbr. trainees
	C4	Inner meetings	4	10	Nbr. trainings
	C5	Movement Recording	3	8	Revenue
General Administration	D1	Launch of trainings	10	25	Nbr. groups
	D2	Inner meetings	7	17	Nbr. trainings
	D3	Preparation of wages	7	17	Nbr. trainers
	D4	Launch of new groups	5	12	Nbr. groups
	D5	Coordination and organization	4	10	Nbr. trainings
	D6	Check and Signature of schooling documents for trainees	4	10	Nbr. trainees
	D7	Supervision of administrative paper	3	9	Nbr. trainings
Schooling	E1	Preparation of administrative documents	11	27	Nbr. trainees
	E2	Periodic reports	8	20	Nbr. groups
	E3	Inner meeting	7	18	Nbr. trainings
	E4	Registration and file trainees	7	18	Nbr. trainees
	E5	Organization and archives files	5	12	Nbr.Groups
	E6	Post up in the notice board	2	5	Nbr. groups
General organization	F1	Purchasing	3	8	Revenue
	F2	Organization of ceremony and coffee break	4	10	Nbr. groups
	F3	Technical assistance of course	3	8	Nbr. groups

	F4	Care and maintenance of equipment	5	12	Nbr. groups
	F5	Transport	5	12	Nbr. Companies
	F6	Reprography	20	50	Nbr. trainees
Accountancy	G1	Keeping updating legal book	2	5	Revenue
	G2	Periodic report	10	25	Revenue
	G3	Control of payrolls	3	8	Revenue
	G4	Establish fiscal tasks	20	50	Revenue
	G5	Accounting data entry in software	5	12	Revenue
Finance	H1	Periodic report	12	29	Nbr. groups
	H2	Invoicing and Debt collections	7	17	Nbr. companies
	H3	Track of payment	7	17	Nbr. trainees
	H4	Financial side of offers and negotiation	5	13	Nbr. companies
	H5	Cashing and Keep treasury	3	8	Revenue
	H6	Organization and accounting archive	3	8	Revenue
	H7	Inner meeting	3	8	Nbr. trainings
Marketing	I1	Administration of website, social network, advertising accounts... and updating the database for Emailing	20	50	Nbr. trainings
	I2	Advertising for new sessions	5	13	Nbr. groups
	I3	Outside relationships	5	13	Revenue
	I4	Prospecting and negotiation	5	12	Nbr. companies
	I5	Direct Marketing	5	12	Nbr. groups
Research and Development	J1	Meeting with trainers	10	25	Nbr. trainers
	J2	Reports	10	25	Nbr. groups
	J3	Outside relationships	10	25	Revenue
	J4	Researches	10	25	Nbr. trainings

Source: Created by the student

We have to notice that:

- The number of hours by week is estimate to 40 hours that is the legal duration.
- According to this analysis and following the manual organization with the commentary and modification of employees, the final real activities in the institute are 59 activity plus one (teaching).
- The activity of teaching is mentioned in this table but not enter in calculation of indirect cost because it is the only one that is totally considered as “direct cost” because every course is destined to a specific field training.
- From now on, and in our analysis, we represent activities by their codes.

As reported by the table 4.5 that contains the costs by department, and following the table 4.7 that contains percentages of activities, we can calculate the cost activity depending on this formula:

$$\text{Activity Cost} = \text{Department or service cost} * \text{Percentage of the activity}$$

Example: Activity F1 = Cost of the service General organization * percentage F1

$$= 2\,642\,256,95 * 8\% = 211\,380,55$$

Following this way and gathering activities with common cost-driver, we get the cost centers:

Table 4.8: Center of activities and the unit cost

Center of activities	Center 1	Center 2	Center 3	Center 4	Center 5	Center 6
Activities	A1: 547 636,37	A5: 219 054,55	A6: 219 054,55	A2: 547 636,37	A7: 65 716,36	B2: 394 261,35
	A3: 372 392,73	C3: 346 829,12	B3: 394 261,35	B1: 579 796,11	C1: 641 633,87	B7: 115 959,22
	A4: 219 054,55	E1: 459 499,26	D3: 364 953,69	B4: 301 493,97	D1: 536 696,61	F5: 317 070,83
	C5: 138 731,64	E4: 306 332,84	J1: 445 835,72	B5: 301 493,97	D4: 257 614,37	H2: 299 411,91
	F1: 211 380,55	F6: 1 321 128,47		B6: 231 918,44	E2: 340 369,83	H4: 228 962,05
	G1: 83 465,68	H3: 299 411,91		C2: 433 536,40	E6: 85 092,45	I4: 214 384,11
	G2: 417 328,43	D6: 214 678,64		C4: 173 414,56	F2: 264 225,69	
	G3: 133 545,09			D2: 364 953,69	F3: 211 380,55	
	G4: 834 656,86			D5: 214 678,64	F4: 317 070,83	
	G5: 200 317,64			D7: 193 210,78	H1: 510 761,50	
	H5: 140 899,72			E3: 306 332,84	I2: 232 249,46	
	H6: 140 899,72			H7: 140 899,72	I5: 214 384,11	
	I3: 232 249,46			I1: 893 267, 16	J2: 445 835,72	
	J3: 445 835,72			J4: 445 835,72	E5: 204 221,89	
	Total Cost	4 118 394,22	3 166 934,79	1 424 105,31	5 128 468,37	4 327 253,29
Cost driver	Revenue	Number of trainees	Number of trainers	Number of trainings	Number of groups	Number of companies
Quantity	570 435,53	1 578	128	50	243	158
Unit cost	7,22	2 006,92	11 125,82	102 569,36	17 807,62	9 937,02
Differences	-150,3	-0,75	0,35	0,37	1,63	0,31

Source: Created by the student

4.4 – Result by field with ABC: The following table shows results by fields:

Table 4.9: Result of three last years (2015-2016-2017) by field

Designation	QHSE	Finance and accountancy	Marketing and Trade	Human resources	Production and Logistic	Admin. and legal	IT Trainings	Languages	TOTAL
Incomes	36 917 415.55	980 000.00	1 771 500.00	2 620 200.00	2 247 533.33	354 200.00	8 949 804.33	3 202 900.00	57 043 553.21
Direct Cost									
Learners	13 964 225.62	344 115.75	637 850.00	995 600.00	764 161.33	123 900.00	2 804 622.47	2 049 888.22	21 684 363.39
Documentation	324 323.12	26 520.00	21 120.00	25 080.00	10 200.00	7 200.00	53 760.00	225 480.00	693 683.12
Rental cost	1 127 000.00	158 000.00	/	/	/	/	220 000.00	/	1 505 000.00
Catering cost	1 921 000.00	/	/	/	/	/	320 000.00	/	2 241 000.00
Tax TAP	738 348.31	19 600.00	35 430.00	52 404,00	44 950.66	7 084.00	178 996.08	64 058.00	1 140 871.06
Total direct cost	18 074 897.05	548 235.75	694 400.00	1 073 084.00	819 311.99	138 184.00	3 577 378.55	2 339 426.22	27 264 917.57
Indirect cost									
Center 1	2 665 437,36	70 756,00	127 902,30	189 178,44	162 271,88	25 573,24	646 175,85	231 249,38	4 118 544,45
Center 2	1 216 193,52	54 186,84	72 249,12	108 373,68	100 346,00	16 055,36	421 453,20	1 178 062,04	3 166 919,79
Center 3	712 052,48	66 754,92	66 754,92	111 258,20	55 629,10	33 377,46	144 635,66	233 642,22	1 424 104,96
Center 4	1 641 109,76	307 708,08	205 138,72	205 138,72	205 138,72	102 569,36	2 153 956,56	307 708,08	5 128 468,00
Center 5	1 994 453,44	71 230,48	71 230,48	53 422,86	35 615,24	17 807,62	552 036,22	1 531 455,32	4 327 251,66
Center 6	1 132 820,28	198 740,40	59 622,12	39 748,08	19 874,04	19 874,04	59 622,12	39 748,08	1 570 049,16
Total Indirect cost	9 362 066,84	769 376,72	602 897,66	707 119,98	578 874,98	215 257,08	3 977 879,61	3 521 865,12	19 735 337,99
Result	9 480 451,66	-337 612,47	474 202,34	839 996,02	849 346,35	758,92	1 394 546,17	- 2 658 391,34	10 043 297,64

Source: Created by the student

The subtraction between the result and differences of calculation gives the exact result
 $10\,043\,297,64 - (-148,39) = \mathbf{10\,043\,446,03}$

From this table, we notice that:

1 – As shown by the table of numbers and table of trainees and the revenue, the result of HSE is the biggest one (94% of the global result), we can conclude that the HSE field is the principal field in the institute in term of the number of trainees, the revenue and the profit.

2 – Despite the big number of trainees and studies in languages, this field has a negative result (-2 658 391,34), it needs to be reviewed and analyzed for trying remedy the situation.

3 – Except the IT, the results of the others fields are insignificant, it is recommended to reinforce them by a politic of advertising to increase the number of groups.

In fact, the institute is in front of a big decision, the specialization in HSE or continuing in diversification and reinforce the others fields.

However, this is the limits of ABC, it gives only an accurate result by field but without allowing what is the path to improving the performance. Among the limits of ABC, is giving only the financial vision of the situation, it does not take the others side of the decision-making, it might also distort it, as we will discover especially in the IT field.

5 – Process analysis with ABM

Based on the results provided by applying ABC approach, ABM identify the value-added activities and improve them while also working to eliminated or reduce non valued-added activities.

5.1. From ABC to ABM:

The narrow scope of ABC can be completed by the wider scope of ABM. The measurements of cost and the performance of the various activities, cost object and resources are not sufficient to calculate the waste time and improve the global performance of the organization. The reduction of cost needs a deeper analysis of the process that allows managing activities

by improving the added-value activities and eliminating or reducing the non-added-value activities of the organizations.

In the case of TECHNOFORMAT, the manual organization gives a list of tasks in which we deduce activities, but it does not give the sequences of those activities.

The analysis of activities has identified 60 activities in the institute. The reduction of costs and the optimization of the process pass by, firstly the classification of activities into primary and support activities, and then studying the possibility of improving the added-value activities (primary activities) and reducing the non-added-value activities (support activities).

The enumeration of 60 activities of the institute needs to be prioritized by the flowchart in which it would be possible to show the progressive steps of trainings from the beginning to the end. This is why we need to apply ABM, it allows managers to manage these activities one by one according to the specificities of each one.

5.2. Process of trainings

In fact, although of putting the fields of training as an object of cost is justified by the difference between stakeholders of each fields (Trainees, trainers, companies ...). However, the classification by the type of trainings (long, middle and short period) seems more practical in term of duration and sequences of activities. The longer the duration of training, the more process is different and complicated, the more resources are consumed, and employees make more efforts.

Therefore, it has appeared that modeling the flowchart of each process allows to show and understand the ordering and succession of activities and to make the difference between the three types of trainings to identify the primary activities and the support ones.

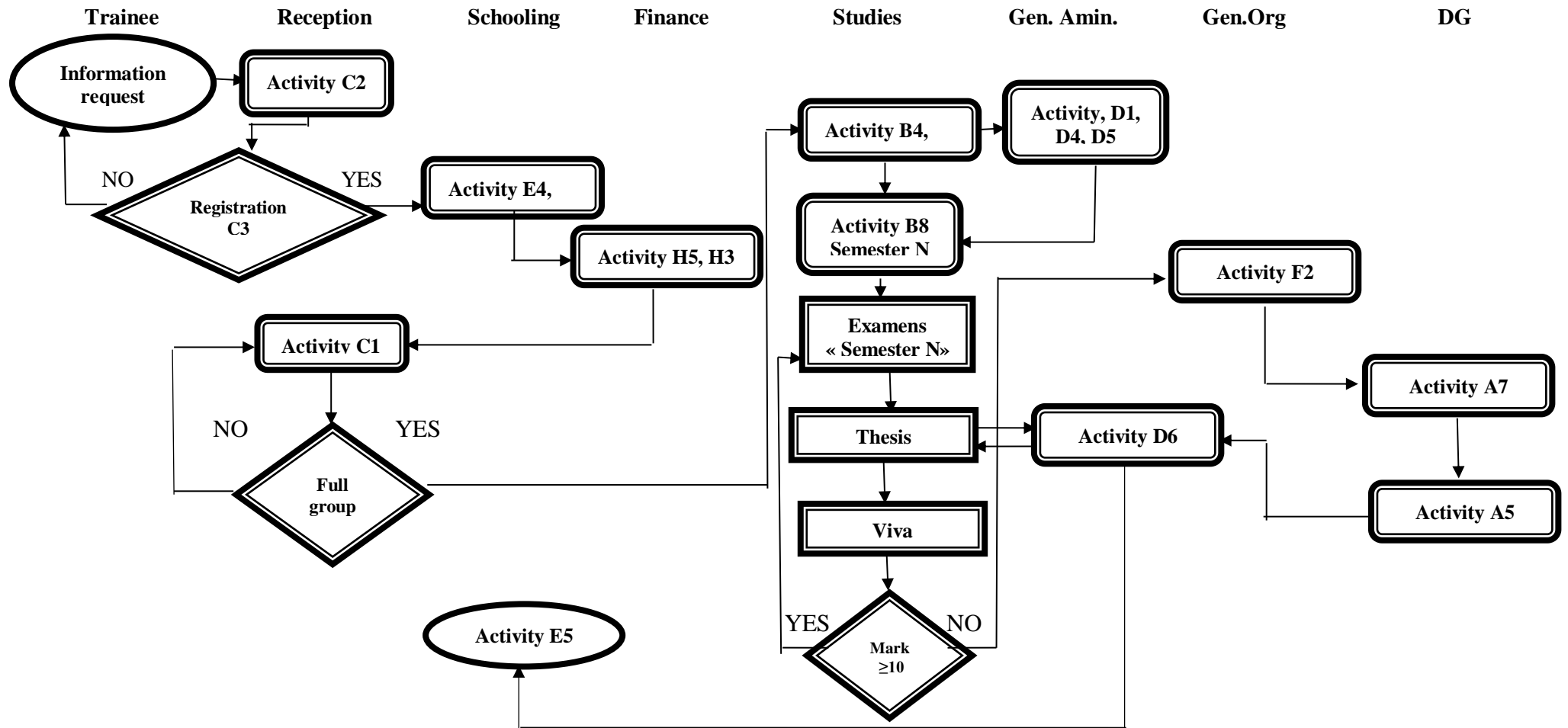
Following our observation and according to the interviews with departments, it proved that there is another different process concerning companies; dealing with companies is subject to different activities and so, we will add a fourth flowchart for companies.

5.2.1 – Flowchart of long trainings process

This type of trainings is not very frequent; there is not a large number of groups. Currently, only two groups in IT fields are operational. There are daily courses throughout two years during divided in four semesters, that means the consumption of material resources is high and daily efforts are provided for the smooth running of courses.

The following diagram is the flowchart of a long period training; there are ordering activities and the services or department that ensure it:

Figure 4.2: Flow chart of long training process



Source: Created by the student

The flow chart of long training process shows the separate steps, from the beginning to the end of a training, in which a trainee pass through to obtain his diploma.

In the case of TECHNOFORMAT, it concerns only two groups in the IT fields:

- 1- Web and multimedia developer.
- 2- Administration and security of computer networks.

These trainings extend to around three years (30 months); 24 months of courses and 6 months of practical internship, thus, the trainee passes by the following steps:

- 1 – **Information request:** potential trainees come close to the Institute for information about the training. This request may be face-to-face, by email or by telephone. They are received by the **reception service**.
- 2 – **First Registration:** After receiving all information, the trainee decides to register or not in the training. If yes, a pre-registration is done by the **reception service** to keep the main information about the trainee (Name, phone number, timetable and mail).
- 3 – **Final registration:** when the student provides his file, he is received by the **schooling service** in which it opens officially, a file to this trainee and he has the right to receive a school certificate and card trainee. In this step, the student pass also by the **financial service** to pay the total fees or just a portion and receive a financial schedule in which the financial service must take the responsibility and ensure the respect of this schedule.
- 4 – **Fullness of the group:** After the final registration, the **reception service** work to coordinate between trainees taking into account the timetable and inform the studies department when the group with a given number is ready to start.
- 5 – **Pedagogical preparation:** the **studies department** has to design trainers, the content of training updated and the proposal schedule taking into account with coordination of administration service the availability of classrooms.
- 6 – **Start of training:** the launch of new groups is supervised by the **administration department** that ensure logistic and teaching material. It is also its responsibility to follow the smooth progress of training, ensure all administrative procedure with the direction of professional training and provide administration and schooling documents as the opening PV and the insurance.
- 7 – **Teaching:** it is the step in which trainers provide knowledge and share their experiences with trainees in a specific topic and specific duration, it is on the charge on **studies department**.

8 – *Internship period*: In this period, trainees need some documents as outside insurance and internship contract, this is insured by the **department of administration**.

9 – *Viva*: At the end of the internship period, the trainee must depose a thesis and present it. The presentation is done in the public institute of professional training in Mohamadia, all this procedure are followed by the **studies department**.

10 – *Graduation ceremony*: is organized after the presentation of the thesis. The organization is insured by the **organization service** and it is done in the presence of de **general director** after the signing of provisional certificates of achievement waiting for diplomas from the ministry of professional training.

11 – *Archiving*: is the last step and it is done by the **schooling service**.

Primary Activity:

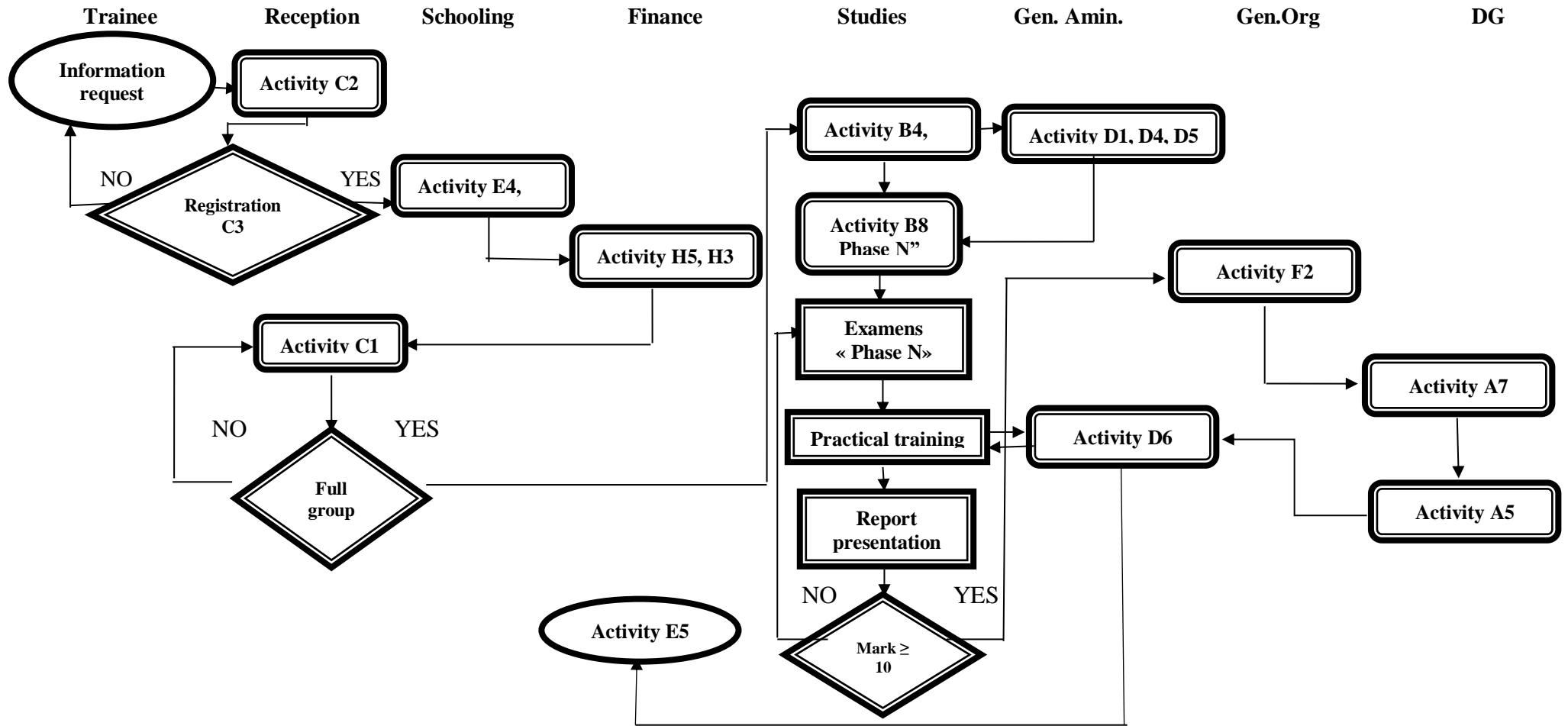
From this steps, we can extract the primary activities of this process:

C2, C3, E1,E4, H5, H3, C1, B4, B6, D1, D4, D5, B8, D6, F2, A7, A5, E5

5.2.2 – Flowchart of middle trainings process

It contains the most important number of groups, especially groups in HSE. Generally, it concerns trainings until 9 months, so the degree of consuming cost is less than the long process and it is an inner process, it does not need a permanent contact with the profession training direction:

Figure 4.3: Flow chart of Middle trainings process



Source: Created by the student

The flow chart of Middle trainings process shows the separate steps, from the beginning to the end of a training, in which a trainee pass through to obtain his diploma. This type of training is between (60) sixty hours to (270) two hundred and seventy hours of courses. It cans be blocked courses or alternatively until (9) nine months.

Actually, almost all the trainings in this process concern HSE (Manager QHSE, Supervisor QHSE, Inspector HSE and Agent HSE), so the mastery of this process is an opportunity to reduce cost or improving and optimizing it.

One regards to steps, they are the same as the long period training process except for the following points:

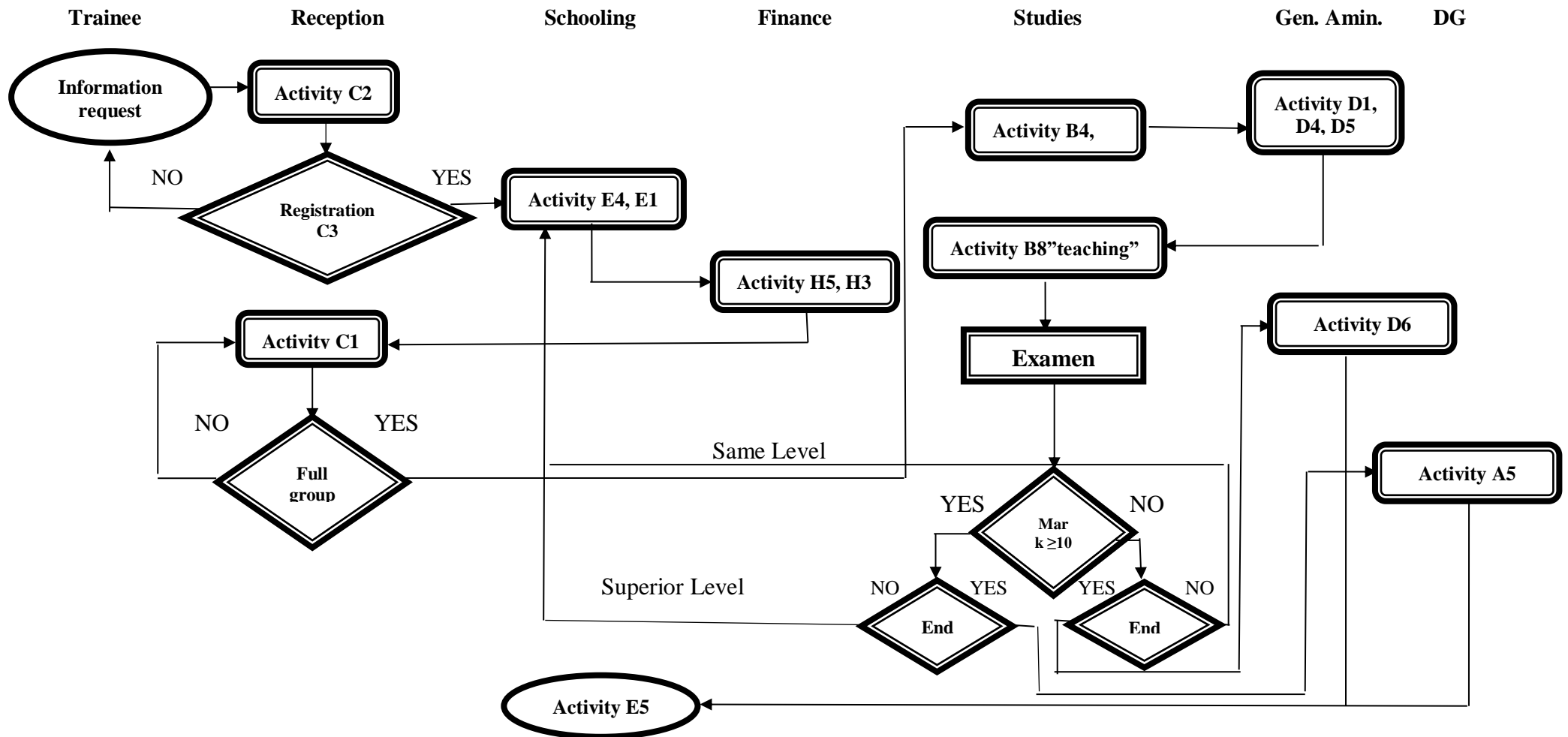
- They are inner trainings, it means the organization of the training is done inside of the institute and there is no need to coordinate with the public institute, and that presents an advantage regarding the flexibility and the freedom in case of procedure and the modules and it ends by an inner certificate of qualification.
- The project of the end of training is simplified, it needs only a small report for inspectors, with a small presentation for supervisors and managers, and it is done in front a trainer and the responsible of the studies department.
- The period of internship is between 15 days and three months.
- The most important difference between the long period process and the middle one is the duration of trainings and the consequences on the cost because the indirect cost of trainings is supported for a long period trainings more than the middle period what can reduce the profitability.

Primary activities: the primary activities in this process are the same as the long period process.

5.2.3 – Flowchart of continuing trainings process

The specificity of this flowchart is related the difficulty of adjusting the duration of trainings and the number of trainees, because every training (as languages) has a specific duration and the trainees can continue in the next level or not, and others can leave the group or enter in the next level following the result of their entrance test.

Figure 4.4: Flow chart of continuing trainings Process



Source: Created by the student

The continuing trainings is a specific process of training because it comes between short and middle period. The specificity of this process is in the fact that the duration of the training is renewable by level. It is impossible to fix the duration of all the training. At the end of a level, there is a test, and in the superior level, we can find the same trainees as we can find others new in the group.

Languages and IT training are the principles field of this process. The steps of this process are the same in two first workflow add these following points:

- Both Activities F2 and A7 do not exist because there is no graduate ceremony to organize by the organization service and do not need the presence of the general director .These trainings end by the renewable of training to a superior level or by a gradual abundance of trainees, and there is no a specific qualification for languages.
- Trainees at every end of a level renew the registration at the schooling service.
- In ABC approach, we gather trainees by field, but in this process approach, we gather trainees by a process. For example, IT trainings contains long period training, continuing training period and companies training process. The performance of the field can vary from a process to another one. This a critical point because managers can make a wrong decision basing on ABC result, they need process approach to lake better decision.

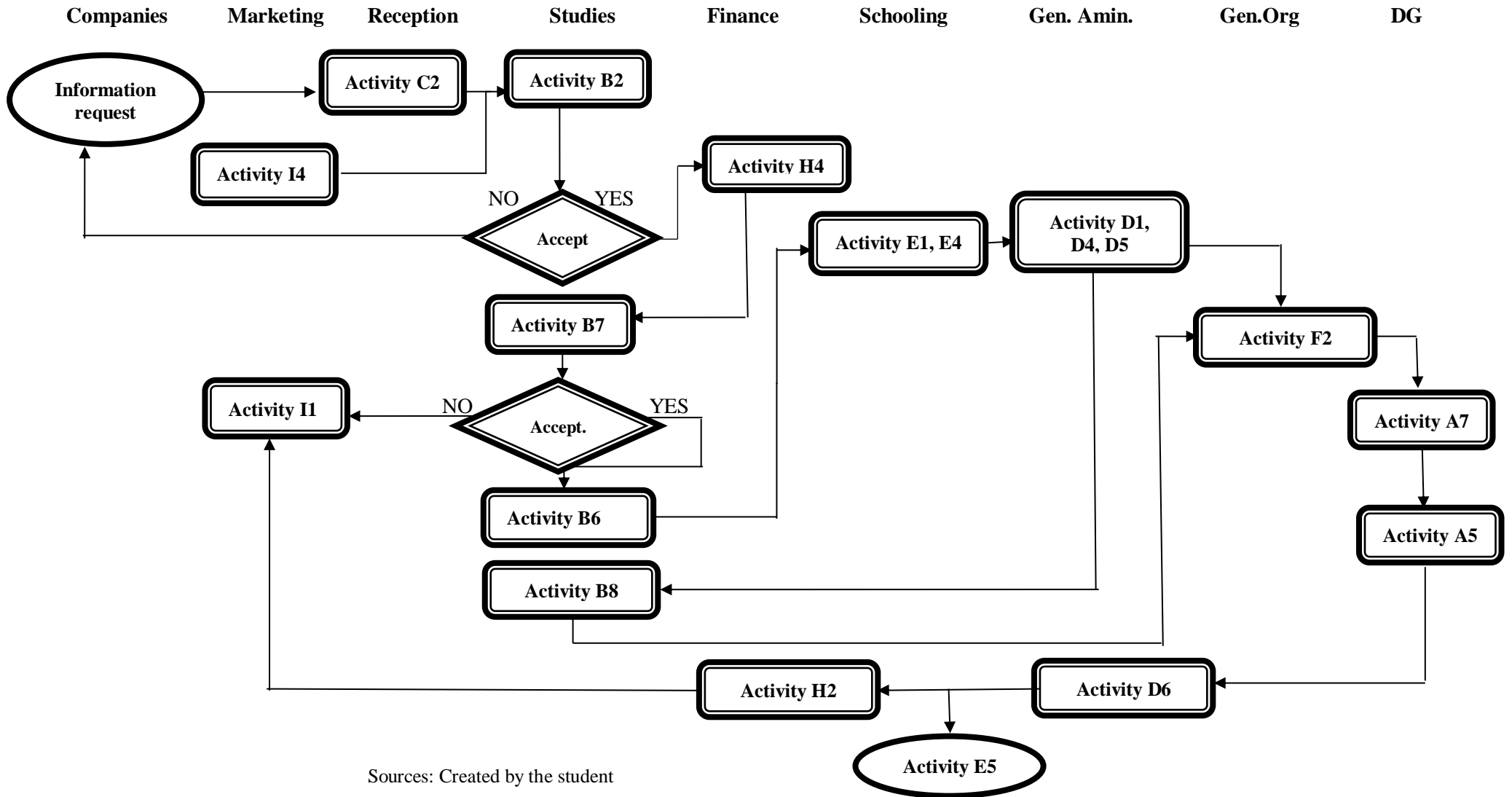
Primary activities:

The primary activities in this process are the same as the long period process except F2 and A7.

5.2.4 – Flowchart of companies’ trainings process

It is the most different process, because the start of the training and the progress is not following the same process:

Figure 4.5: Flow chart of companies' trainings process



The flow chart of companies' trainings process is the most different one in the institute. It has a specific steps from the beginning to the end and it needs the involvement of others activities and service.

Before given the different steps of this process, we have to notice that this process contains only groups of companies, then when a company send one trainee in a group of a specific training is not taken in consideration.

1 – Identification of needs: companies express their needs of trainings by asking about a specific training or by request the sending of the trainings catalogue and the periodic program. They express their needs by email by phone or by fax. It also considered as an identifying of needs the specifications brought by the marketing service.

The reception service provide a general information and transfer the call or the email to the studies department.

2 – Technical sheet: the studies department prepare the technical side of the offer.

3 – Offers: If the company answer positively to the request, the financial service prepare the financial side of the offer.

4 – Programming: when the company accept the offer and the contract is signed, the department of studies establish the schedule and the content of the training and the schooling service receive the final list of trainees and their files then prepare documents. The general organization service prepare also logistic and teaching material whether the training take place in the institute places or in another place.

5 – Teaching: insured by the department of studies.

6 – Graduate ceremony: in the final of the training, the organization service prepare the ceremony and generally the general director assist to the ceremony after signing the certificates of training.

7 – Closing of the training: the general administration service insure all procedures of closing, the schooling service archives files, the financial service prepare draw up invoices and follow the payment, and finally the marketing service keep the coordinates in order to update database, follow the satisfaction and request the satisfactory execution certificate.

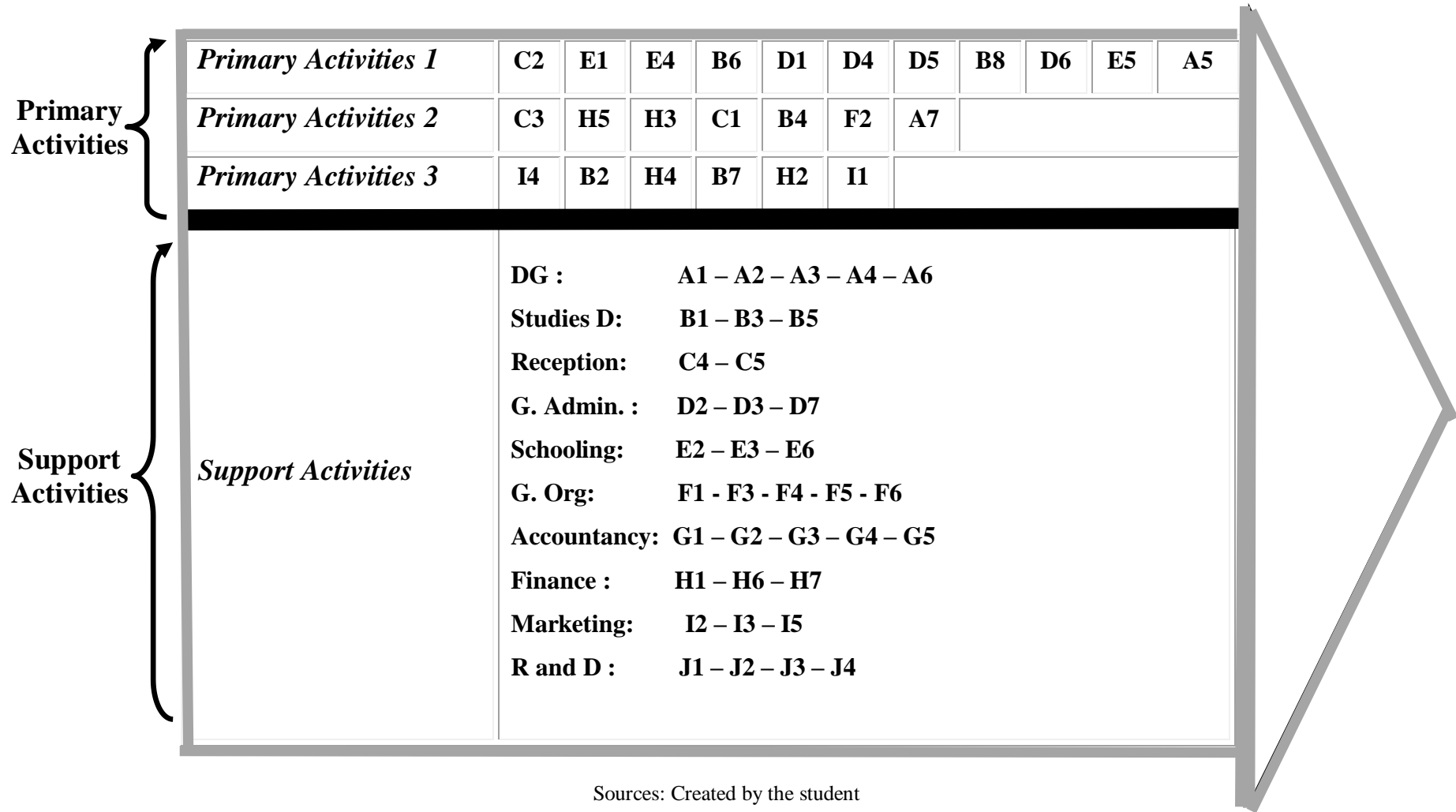
Primary Activity:

From these steps, we can extract the primary activities of this process:

C2, A4, B2, H4, B7, B6, E1,E4, D1, D4, D5, B8, F2, A7, A5, D6, E5, H2, I1

5.3 Value chain Analysis

Figure 4.6 : TECHNOFORMAT's Values Chain



The classification of activities into a primary and support activities is an indicator of the importance of the activity. The previous classification is used to distinguish between activities in order of importance and be aware that the modification of some activities can modify the four process existing in the institute.

Consider this activity as Value-added or not need a deeper study including applying modifications in the process and check the consequences of these modifications, if it was useful or it might need other operations.

In this passage, we try to propose improvement actions to reduce cost, improve performance by suggesting some operations in order to ameliorate added-value activities, and try to reduce or eliminate non-add-value activities.

These improvement actions will not brush all the activities of the institute; it will be confined to some activities in which we have estimated that a modification can be useful.

5.4 ABM to improve operations

5.4.1- Value-added activities:

1 - Activity B8 “Teaching”: The principal activity of the institute is the activity of “teaching”. Mastering this activity means mastering around 77% of direct cost and around 46% of the total cost. Teaching cost represent also, around 36% of the revenue (following the table 4.8). In fact, the politic of quality adopted by the institute and the requirements of consumers make the operation of reducing cost in this activity very sensitive.

The objective in value-added activities is to improve them. The improvement of the quality of teaching pass certainly by contracting with high-level experts and trainers. This automatically increases the cost of teaching that is already high and need to be reduced.

The solution that we can propose in this case, is to, partially set up the E-learning process. It does not require many changes, it needs only to do a partial of courses online and keep the practical side of the training with obligatory presence. It may be applicable for all trainings progressively depending on the necessity and the opportunity that may look doable.

As a beginning, we try to apply a partial E-learning to a short training for companies in order to show the benefits. Generally, any course take, at least one year before needing to be updated, it would be better to record a video that contains the theoretical part of the course and keep this video for all groups of the year.

The worries may concern the type of contract with the trainer, this contract can contain a definite percentage for every broadcasting of the video in which this percentage is logical, much less than the classic course. Concerning the platform hosting, it exist in Algeria a number of companies that provide this service with low prices, especially for small courses.

This is an example of a partial E-learning course:

Table 4.10: Difference between the result with classic course and partial E-learning

Designation	Classic course			Partial E-learning		
	Unit/ day	Price	Amount	Unit/ day	Price	Amount
Revenue	5	59 000,00	295 000,00	5	59 000,00	295000,00
Teaching	5	20 000,00	100 000,00	2	20 000,00	40 000,00
E-course	-	-	-	½	20 000,00	10 000,00
Documentation and catering	5	13 000,00	65 000,00	2	15 000,00	30 000,00
Total direct cost	/	/	165 000,00	/	/	80 000,00
Result	/	/	130 000,00	/	/	215 000,00

Source: Created by the student

This is an example of a short period training (5 days) which is the most familiar and requested by companies. As we see, the direct cost decreased from 165 000 DA to 80 000 DA (51%). It is true that the indirect cost will increase due to the cost of the platform hosting and the administration of this electronic registration, but those costs will be shared all along the year between every group.

The advantages go far beyond the simple financial ones. The availability of employees in companies and find a common schedule between them is the big problem that troubling the training services of the overwhelming majority of companies.

According to the accounting department, there are some companies that established the order form in 2013 and do not arrive to form the group in 2016. There are others were obliged to change the purpose of the training and send out their employees one by one in different groups. It is frequent that the institute receives a list of 12 trainees and be surprised by three trainees the

day of training, which represent a huge waste of money and energy for both companies and institute.

The E-learning resolves those problems whether for companies by providing a solution of availability or for the institute by reducing the cost, without forgetting the attractiveness of E-learning that is a sign of modernity and easiness.

The particular trainees also benefit from the E-learning process by avoiding the travel expenses and accommodation and it gives the opportunity to workers improving their skills and may find out better jobs.

It stays the question of the training quality and if the message passes correctly, especially for companies because of the context change from one company to another. Our proposition is to try a partial E-learning to not lose the context and the quality, but it needs others studies and research that highlight this problematic.

2 - Activity C2 “Answering for request information”: This activity consumes 25% of the time for the reception service, and it is done in a traditional way (word of mouth, phone call), this activity can be lightened by detailing and more explanation with short videos in the website and social network.

3 - Activity C3 “First registration”: This activity consumer 10% of the time for reception service while it can be done by the trainee himself in the website without a series of questions face to face that consume time.

4 - Activities E1, E4, E5, A7, H5, H3, H4, D5, and D6: All these activities concern the final registration, the administration of files, the organization of trainings and all administrative documents until the signing of certificates. All those activities are done using a classical software’s as Microsoft word and excel that take time to coordinate between services and prone to errors. A schooling software adapted to the process of the institute is very useful and effective. It allows avoiding mistakes and reduce time of execution, which has repercussions on the satisfaction of costumers, and accord a good reputation to the institute.

The adapted software to this approach is SAS Activity-Based Management, which is an analytic application that models business processes to determine cost, profitability and drivers. With this

solution, organizations can make informed decisions that streamline processes, deliver revenue growth and reduce costs across the organization.

It is so expensive, but in case of enlargement of the waist of the institute, it would be helpful.

5 - Activity I1 “Updating database for Emailing”: This activity should be generalized on the three other process, actually it concerns only the companies’ process for Emailing, but it is recommended to increase the database with the email address of all trainees to brush the maximum of population for keeping a relationship, insure a good communication and advertise for future trainings.

6 - Activity I4 “prospecting for specifications”: Currently, there are companies that are specialized in gathering specifications, it needs only an annual subscription that does not exceed 20 000 DA, it avoids the random search.

According to our observation, there are quite many companies call the Institute for sending them graduate trainees for jobs. The answer to this request is heavy and done in a random way. It is recommended to add to this activity the task of keeping CV in marketing service in an electronic file to send them out to companies and follow trainees hiring of the institute to add it in the advertisements.

5.4.2 - Non-Value-added activities:

1 – Accountancy activities “From G1 to G5”: According to the article n°13 of the finance law of 2015, companies with annual revenue less than 30 000 000 DA can switch to inclusive tax system in which the company does not need to keep a detailed accountancy. The institute has the possibility to subcontract its accountancy to an accounting firm, in which the price range varies between 50 000 DA and 200 000 DA per year. It allows reducing the cost of this department from 556 437,90 DA (1 669 313,72/ 3) per year to a maximum of 200 000 DA per year which give a reduction of 356 437,90 DA (64%) per year.

2 – Activities “A2, B1, C4, D2, E3, H7” Inner meeting: Meetings between departments and services consume an average of 17% of the working time, which give 27 hours per month is consumed in meetings. It is up to the managers estimating if it is so much or not, but what we have noticed, the meetings are done in anytime without planning or specific agenda. We estimate that with an agenda and pre-announcement the duration can be reduced.

3 – Activity C5 “Movement recording”: In this activity, the reception service write in a register everything may happened at the institute, and in the last of the day, they prepare a daily report. This second operation is not necessary; the register can be reconsidered as a daily report.

4 – Activity F6 “Reprography”: Reprography tasks take the half time of the general organization service, it costs 1 321 128,47 DA, it is the highest activity at the institute. A simple analysis of the cost nature of this service shows that it is about the photocopier consumables and the preparation of pedagogical documents for trainees.

The calculation of the cost of one document reveals that it cost 120 DA as a direct cost. The subcontracting of the pedagogical documents with a printing house cost (according to a pro forma invoice) around 120 DA but with a high quality, then it allows to the institute to improve not only in quality but also reduce cost because 120 DA is only the direct cost.

Conclusion

Through this chapter, we could see how to identify activities in order to allocate the accurate cost to the right product and then applying activity-based costing method. We could see also how to identify process and then determining the value chain of the institute that allows proposing certain improvement actions to added-value activities and reducing or eliminating non-value-added activities.

CONCLUSION

As technology transforms ways of learning, the need for innovation in the professional training sector is critical. The challenges facing schools and institutes necessitate a hurried adaptation with the current circumstances by enhancing the process of training whether to use technology in training or to control costs.

Activity-based Cost Management seems the most innovative method enable to make the desired change, whether to controlling cost with ABC or to improve processes with ABM.

The purpose of this thesis was to examine the applicability of an Activity-Based Cost Management approach in an institute of training. This gives rise to pass by steps of applying this method; how to identify activities to applying ABC, and how to identify processes and value chain to apply ABM.

The methodology used in order to achieve the purpose of this study was a mixed method design. A case study uses the quantitative approach to the accounting side and data processing, and qualitative approach like the observation and interviews to analyze activities.

As a result of this work, sixty activities identified. This study explains with detail the financial result of each field of training apart; now it is clear that the HSE field is the more profitable one at the institute, and the languages field is in a deficit. The application of Activity-Based costing have shown the divergence existing between trainings in term of financial result.

In addition, process analysis achieves to identify four different processes at the institute, every process contains a number of successive activities from the first contact with customers to the last step of the training. These activities are considered as primary activities (Added-value activities), and the rest of activities are considered as support activities (Non-added-value activities). With this classification, the value chain of the institute established. The value chain in the key to separate between Added-value and Non-added-value activities.

In a managerial perspective, the result of this study is very important to managers; it allows not only to take decisions concerning the deficit fields but also, it provides a horizontal view of the institute through a number of activities that permit to understand deeply the process of trainings. Every activity has its cost and its importance (primary or support activity), so managers have a clear vision if they want to modify the activity or all the process. They can also define responsibilities and pick up anomalies.

In case of an E-learning project, managers can detect the activities that will be affected by the modification of the process, and they can calculate the consequences of their decisions.

From the previous result, it seems the implementation of an ABCM system at the institute is feasible and useful, but in order to perfect the set-up of this system we emphasis on the following points:

- ✓ Ineffective information system: The institute use software for the accounting department, data are available and easy to extract. However, information is separated and stocked at every department apart. It is important to networking all information and details of activities and department and put it available to users and decision makers.
- ✓ It is true that the application of Activity-Based Costing has shown the result of every field, but the result does not express the real performance of the field. The example of the field IT explain this; long trainings process, continuing trainings process, and companies trainings process are included in this field, and the profitability of every process is different from others. Managers should not be limited their vision to a field performance, because one field can have different processes with different performances.
- ✓ Because the information needed are financial and non-financial, the application of this system does not concern only the financial and accounting department, it is before everything else a global approach adopted and supported by the top management.

Finally, it is inevitable to come across some difficulties and obstacles through the period of research. The encountered difficulties are:

- ✓ Limited period of the internship does not allow understand deeply the process of training, the identification of activities and the time estimation of every activity needs more time.
- ✓ Observation and interviews are more or less subjective method of evaluation; interviews depends on the personality and intentions of interviewed employees.
- ✓ The difficulty of determination of the most representative cost-driver: For example, the determination of the real number of trainees is not easy because it is probable that certain trainees stop and restart their training or do more than one training at the same period.

Although it seems almost impossible to bring to perfection, the perspective of this research is opened by the above difficulties. We can add two important perspectives:

1 – This study is very useful to an eventual project of E-learning at the Institute; the detail activities make easy the determination of changed activities. Further, the question of the training quality on an E-learning approach plus the consumer behaviour need a deeper research.

2- Eliminate activities or reduce costs mean reduce employees, to be performing you have to cut jobs, to make more profit you must create unemployment, what about the ethical side of the managerial accounting?

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