

Creating Activity-Based Costing System Tool

Case: Service Company X

Sayed Mehdi Kazemi

Bachelor's Thesis
International Business
2015



Author Sayed Mehdi Kazemi	
Degree programme International Business	
Report/thesis title Creating Activity Based Costing System Tool	Number of pages and appendix pages 44 +17
<p>This product-based thesis is meant to create an Activity- Based costing system tool for company X, which provides after-school care for children and is a sub-contractor of municipality of Y.</p> <p>The thesis aims to create costing information system mechanism for the case company in order to be used as a means to understand cost, costing issues and profitability of the cost objects in this case. Hence this thesis does not address the way of using information and analyzing it. As that is another issue and relates to the Activity based management.</p> <p>This study was started by meeting the manager of the company about the topic in February 2015. Then I started to study ABC's system issues were then studied in view of theory. The process of creating the tool started by studying the income statement and interviewing the manager of the company to collect as much information as possible. During the process the nature and type of required information was revised and changed for many times.</p> <p>The final result is a tool which can be helpful to understand cost and profitability of the firm as a whole.</p>	
Keywords ABC, Cost, Cost behavior, Direct/ Indirect Cost/ labor and material,	

Table of contents

1	Introduction	1
1.1	Background and project problem	1
1.2	Project objectives and tasks.....	2
1.3	Internationalization and project risks	3
1.4	Demarcation	3
1.5	The project result	3
1.6	Stakeholder benefits	3
1.7	Key concepts	4
1.8	Education and Training industry.....	5
1.9	Case company.....	6
1.10	Structure of the project.....	6
2	Theoretical framework.....	7
2.1	ABC definition	8
2.2	ABC in service sectors.....	9
2.3	Advantages and disadvantages	10
2.4	Costs and cost behavior.....	11
2.5	Elements of Cost.....	13
2.5.1	Overheads	13
2.6	Sources of data collection	14
2.7	Key components of Activity-Based Costing	14
2.8	Implementation Guidelines and Steps.....	15
3	Implementing ABC to the company X.....	17
3.1	Discussion	17
3.2	Cost and cost behavior of the company	20
3.3	Implementation Steps and Designing the tool	21
3.3.1	Identifying Cost objects	23
3.3.2	Identifying Direct Costs of Cost objects	24
3.3.3	Identifying activities and allocation bases for allocating indirect costs to cost objects.....	29
3.3.4	Identifying costs of activities.....	31
3.3.5	Computing the rate per unit of cost allocation bases	34
3.3.6	Computing indirect costs of cost objects	34
3.3.7	Adding direct and indirect costs of each cost object:	35
3.4	Profitability Analysis	36
3.4.1	Conclusion	36
4	Summary and personal learning.....	40

List of tables	41
List of figures	42
Reference	43
Appendix 1.....	45
Appendix 2.....	46
Appendix 3.....	47

1 Introduction

1.1 Background and project problem

The idea of doing this project occurred to me by the time I was doing the managerial accounting course. Science then I was looking for an opportunity to do such a project until I talked with the manager of the company X and told him my Idea. He was quite enthusiastic about the project and accepted to offer me required information and support. This thesis will create value to the case company by making a cost measurement and management system which is highly important in pricing and decision-making process.

The owner of the company saw an opportunity to make profit by providing after-school care services for children and selling it to the municipality. There are two potential directions for the company to move towards to raise profit whether by increasing profit or decreasing cost. So, due to the pricing constraints profit-making would be impossible and focus must be on the cost management and costing issues.

By using a cost management system, the company will be able to manage its resources efficiently. It is not only about cost determination, but also involves decision-making about the entire process such as cost allocation, and resourcing. Selecting the proper costing tool for the company, product and service is highly important in cost management. There are two classified methods of cost management: (Onat, Anitsal, I. & Anitsal, M. 2014, 150.)

1- Traditional costing methods: The focus of these methods is on volume and labor. It is mostly about direct allocation of overheads based on volume or direct labor which causes incorrect allocation and unsettled cost. Also, high volume activities are considered more important than low volume activities.

2- Contemporary costing methods: The focus of these methods is more on value and value adding activities. Moreover service options and delivery times are considered important in service industries as well.

Hence, activity based costing system seems to be a proper way for creating a new costing information system as it is established on cost classifications and allocating them to related activities and cost objects by suitable identified cost drivers. The scope of this product based thesis is to design and implement an ABC system for internal managerial purposes.

1.2 Project objectives and tasks

The aim of this project is to create an Activity-Based costing system tool by Excel which the company can use for internal managerial purposes. The main aim of such a tool is to aid the owner and decision makers have a better costing information system and better understanding of company's expenses of the operating places to manage the business effectively.

The thesis is a qualitative study and in (PT1) a theoretical framework will be made by studying current theories of ABC and other costing issues from different sources such as books, reports, articles and etc. In (PT2) information gathered on implementation will be used to create the tool. Also, needed data related to the company will be gathered by interviewing the operations manager and analyzing the income statement for designing and implementing the tool. (PT3) is about writing a manual guide for users of the tool. In (PT4) the tool will be tested and evaluated by using numbers, however those are not going to be shown in this text because of the confidentiality purposes. Instead, manipulation of the real figures will be used in PT2 while designing the tool. The project tasks are illustrated in table 1.

Table 1: Project tasks (PTs)

<i>Project tasks (PTs)</i>	<i>Theories</i>	<i>Project Management method</i>	<i>Outcome</i>
<i>PT1: Studying ABC and related issues to design theoretical framework</i>	ABC system theories and types of implementation	Desktop Research	Theoretical framework
<i>PT2: Data Collection, Implementing and designing an Excel-based ABC tool</i>	Collecting data through interview and financial statement analysis and implementing based on the theories	Documentary analysis and interviews/ Desktop work	Gathering Primary information / data needed and creating an ABC tool
<i>PT3: Creating User's Manual</i>	Preparing the instruction (guidance)	Based on the tool	Instruction for manager/s
<i>PT4: Evaluating the project</i>	Project evaluation criteria		

1.3 Internationalization and project risks

The case company currently operates in city Y in Finland but, there is a possibility that it starts providing its services abroad for instance Estonia. Therefore, by adjusting preferences such as allocated percentages of activities to cost objects and redefining its costs and expense resources the tool can be applied to foreign operations as well. However, a market and competitors' analysis of the desired countries should be conducted.

The main risk that the project can face is lack of information for many reasons, such as the company is not willing to give its true costs, or company may not have specific information related to its costs and activities. However, the firm is quite eager to have the tool and supports it as much as possible.

1.4 Demarcation

This is a product-based thesis and the purpose is designing an ABC system tool for the company by understanding and categorizing costs related to different activities of the firm to allocate overheads to operating places. At this point the purpose of the project is to create a tool which provides a means of analyzing profitability of operating places. However profitability analysis issues and understanding the result of the tool are not going to be explained deeply in this thesis. Interpreting the results and proper using of the results of the tool as well as changing the costing system are related to Activity-Based Management. The purpose of this tool is to be used for internal decision-making only so the results are not useful for external financial purposes. Also, the thesis is not related to risk management, accounting, and attracting investors. However, the thesis is not about pricing as the company has no authority in charging customers as prices are determined by the Finnish law.

1.5 The project result

The outcome of the project will be an ABC system tool. By using this tool the manager and decision makers will be able to have a greater understanding of the company's cost structure and profitability of the operating places. So, managers can have a useful costing information system to make efficient decisions.

1.6 Stakeholder benefits

The stakeholders are the company, the school and the author. The case company will benefit by using the tool for managerial decision-making purposes.

Haaga-Helia can benefit by understanding the level of its efficiency and practicability of the current training system. However, the author can benefit more by implementing his theoretical knowledge and gaining experience and using it in his future careers. These mentioned benefits can motivate stakeholders to be cooperative during the project.

1.7 Key concepts

ABC: It is an accounting method of identifying different activities performed in an organization and relating direct costs to them by providing an appropriate cost driver, however unlike traditional methods indirect costs are also assigned to activities (Investopedia 2015a).

Cost: It is a monetary measurement of used resources to achieve a defined objective of acquiring products or services (Drury 2008, 27).

Cost object: It is an activity or anything else that requires a separate measurement of cost (Drury 2008, 28).

Direct cost: It is a cost that can be traced directly to a cost object (Drury 2008, 28).

Indirect cost: It is an untraceable cost for a specific cost object (Drury 2008, 28).

Direct material: It is a directly used material to make a product (Drury 2008, 29).

Indirect material: Needed material such as maintenance tools, cleaning products or office supplies to produce products or offer services which are not directly related to the process (WebFinance 2015).

Direct labor: It is a labor that is assigned directly to a specific product or service, e.g. Machine operators, assembly line operators, painters in manufacturing firms and consultants, lawyers and etc. in service firms (accountingtools 2015a).

Indirect Labor: It is a labor which is not directly involved in the production process and is performed to support the process (accountingtools 2015b).

Cost drivers: are assessment indicators of the usage level of expense resources by activities (Institute of Management Accountants 2006, 2).

EBIT: Earnings before interests and tax, is a profit obtained from revenue minus Cost of goods sold and operating expense. Interests and tax are not deducted or added to this profit (Investopedia 2015b).

1.8 Education and Training industry

The chapter 8a in the Finnish legislation provides the act on before- and after school activities 1136/2003.

According to the chapter 8a section 48a, the aims of the morning and afternoon activities are to develop children's emotions in life and ethical growth by engaging them into social activities. Additionally, promoting well-being and equality of society are the aim of providing such activities. These sorts of activities are provided in a peaceful environment under the supervision of skilled and suitable persons. The morning and evening activities' criteria are planned and decided by the National Board of Education in cooperation with the Health research and Development center.

Based on the section 48b of the chapter 8a (1136/2003), The Morning & Afternoon activities can be arranged and provided by the municipality itself or obtained from other public or private service providers. The service is mainly provided for the first and the second years of primary school. Services can be offered to each student either for 570 hours or 760 hours during the school year from the 7:00 to 17:00.

Section 48f of the before-and after school activities act (1136/2003) states that service providers are subjected to a monthly fee. According to the legislation the payment will be a maximum of 60 euro per hour for part-time equivalent of 560 hours and 80 euro per hour for full-time equivalent of 760 hours. However, if the services are provided for 10 days per month and the child is absent due to any reason rather than illness half of the amount will be paid. If the absence lasts for the whole month due to illness no fee will be paid.

1.9 Case company

The company X is providing after school care services for its customers. The company is a sub-contractor of the municipality of Y city in Finland who is buying services provided by the company for final customers who are parents. Customers are mainly employed parents who cannot take care of the children in certain hours from 12:00 am to 17:00 pm, however there are parents whose children require different types of help such as assisting in doing homework and etc.

The company has six operating places and the main office. There are 25 employees working for the company. There are 4 permanent employees, 18 part time and 3 substitutes who are moving from one place to another based on the need of more work force in any of the operating places. Currently there are 261 children, whether part time or full-time using the services provided by the company. Children are categorized into two groups Normal students and Special students that need extra care, even in some cases one particular instructor is needed to take care of them.

1.10 Structure of the project

The text consists of five chapters. Chapter 1: Introduction provides information about the text and the case company. In chapter 2: Theoretical framework describes the theories of implementing and designing of the tool. Chapter 3: Implementing ABC to the company explains the process of the company and the process of designing and implementing the tool based on the provided theories. And finally chapter 4: Summary and Personal Learning is about the text, future consideration and author's learnings from doing the project. There are three appendices in this text. Appendix 1 provides the translated income statement of the company, appendix 2 shows the questionnaire and user manual is available in appendix 3.

2 Theoretical framework

This chapter will discuss Project Task 1 (PT1) which is about gathering theories and models to form theoretical data of the project.

Although understanding costs and their behavior are growing issues for organizations, but still there is a confusion about how to distinguish costs and their measurement methodologies to be competitive in the market as well as being accurate. However, different methodologies of cost measurement such as ABC, Standard costing, Throughput accounting, Target costing and etc. can exist side by side rather than competing against each other. (Institute of Management Accountants 2006.)

According to Hicks (1999, 2) cost information is used by managers and outsiders for making critical decisions such as: Evaluating inventories, Cost of Goods Sold, Strategic & operational planning, Capital & operational budgeting, Cost control, Costing & pricing, Decision modelling and Financial analysis, so, an improper cost information misleads decision makers . Therefore, ABC was introduced in 1980s to correct fundamental problems of traditional standard-costing system.

Traditionally accounting information was used as the source of planning and controlling operation as they were assumed to be accurate and relevant in reflecting the true cost of products and services (Institute of Management Accountants 2006). So, typically the focus was only on labor, material and overheads (Kaplan R.S & Anderson S.R 2007). Because of the automation and changes in industrial engineering ability, instead of mass production many companies started to offer a greater variety of products and services to different types of target groups (Institute of Management Accountants 2006.)

As figure 3 in the next page shows direct expenses are displaced by increasing of indirect expenses. So, a traditional costing system is not applicable due to the rising of the overheads which are not assigned to the products or services and decision makers will be misguided in the process of making decisions. (Institute of Management Accountants 2006.)

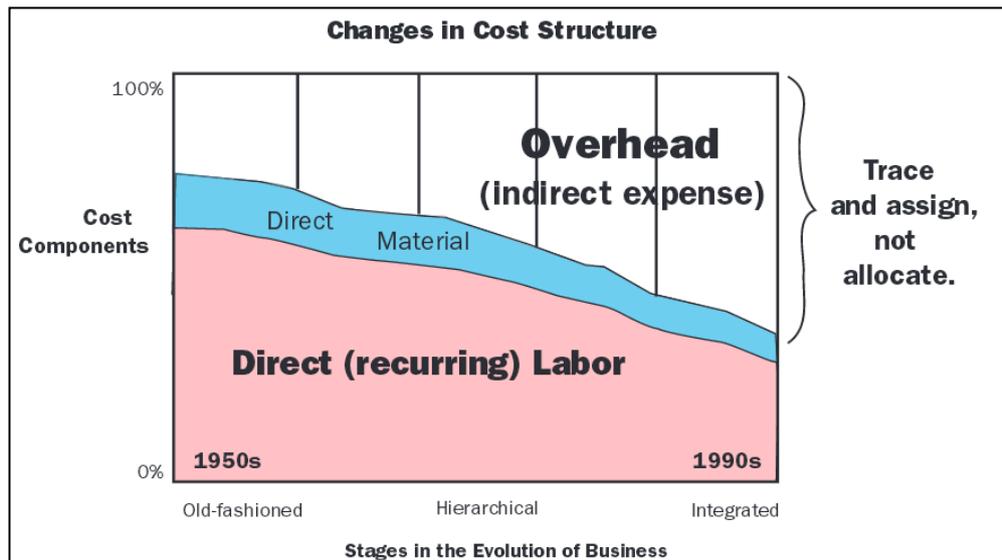


Figure 1: Indirect costs are displacing direct costs (Institute of Management Accountants 2006)

To overcome the lack of visibility of overheads in the traditional costing system, Activity-based costing has been adopted by organizations (Institute of Management Accountants 2006).

2.1 ABC definition

Activity Based Costing system identifies expense resources and allocates them through proper cost drivers to different activities performed in a costing area such as a particular department, plant and organization. Then Activities are designated by activity drivers to cost objects such as products and services that use one or more of those activities. Mostly costs provided by an ABC system are highly accurate and can be used in strategic decision makings by a company. Moreover, managers can have a better understanding of the costs and their relationship to different activities, products and customers. (Horngren, Sundem, Burgstahler & Schatzberg 2014, 153.)

Figure 3 illustrates the relationships of Expenses, Activities and Cost objects in a two stages ABC system.

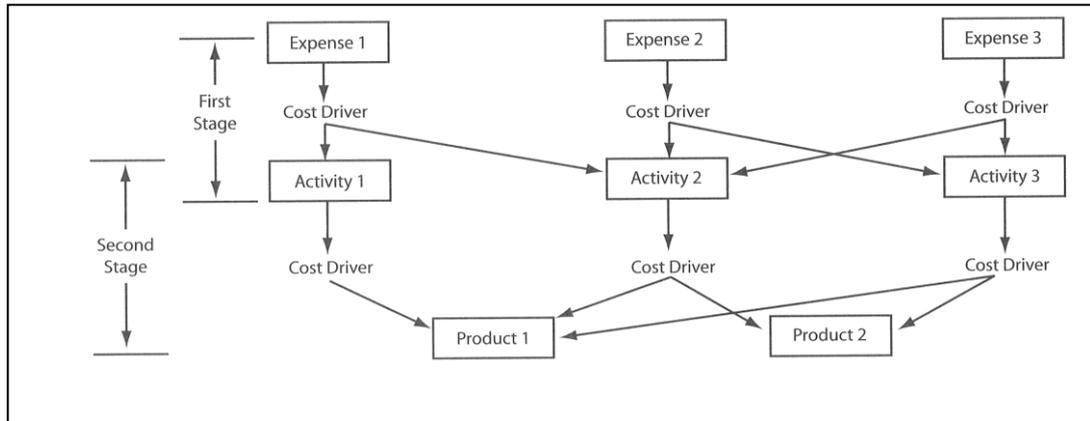


Figure 2: Expense Categories, Activities and Products relationship (Roztocki, Porter, Thomas & Needy 2004)

Hicks (1999, 18) mentioned that to have a useful business utility for any organizations with different sizes, ABC must be treated as a concept, creating an economic model of the business in which accurate and relevant cost information is provided to support all sorts of decisions made by an organization. Further he has mentioned that it is not needed to fully integrate the ABC system into the business however it must be effective.

Activity-Based Costing system can be successful if it starts with accurately well-defined and measured costs, to reflect the cause and effect relationship of the products/services, activities and costs correctly and it is used appropriately (Hicks 1999, 27)

2.2 ABC in service sectors

ABC was primarily meant for manufacturing companies and usually literatures accent its use in manufacturing sectors. Nevertheless, significant growth of economic activity occurs in non-manufacturing companies. Non-manufacturing businesses such as Banks, Insurances and Healthcare etc. can benefit from ABC principles in order to survive in the highly competitive market. Modification of cost management activities is necessary in service sectors not only because of tense competition in service sectors, but also customers demanding of diversified service choices which affects their profitability. Due to the fact service firms are people-intensive, they perform many activities to serve customers so lowering costs of services are a demanding success factor. (Ashford 2011.)

Managers in service firms can use ABC as a tool to identify and reform unnecessary activities to increase customer profitability. As consumption of resources such as direct labor costs and overheads varies by each customer a proper tracking and assigning of costs enables firms to evaluate and analyze each customer's profitability. (Ashford 2011.)

2.3 Advantages and disadvantages

All types of costing methods have advantages and disadvantages but, some of them are more convenient. So, they are more often accepted and used by businesses in different manufacturing or services industries. One of the main reasons for using ABC in service companies is that marketing strategies such as pricing, promotion, branding and etc. can be implemented more effective and creative. More advantages and disadvantages of ABC are mentioned below: (Onat, Anitsal, I. & Anitsal, M. 2014.)

Advantages:

- Product cost improvement and enhancing performance measurement
- More accurate cost information is provided
- Cost reduction improvement
- Activity based performance measurement
- Applicable to cost objects other than products
- Aiming to reduce costs

Disadvantages:

- Complications in implementing of process
- Difficult to identify activities
- Difficult to collect data
- Resistance to change from management and employees

First, implementing ABC system gives the case company the advantage of having a costing system to identify and understand its costs properly. Second, the company can use this tool to make plenty of the decisions from which dropping or accepting places, is the major one. Timing and Data collecting are the two disadvantages that the company will face. Currently, the company does not trace its costs properly and there is no costing system. Records of the expenses are not available or difficult to find. Therefore, because of the level of efforts in the beginning to trace and collect information, the staff in the main office may not be reluctant to use the system. But once they see the benefit of using it, they will be persuaded to use and even improve the current tool.

2.4 Costs and cost behavior

Costs are usually monetary measurements of sacrificed resources for achieving specified goals and objectives (Drury 2008, 27). Costs can be actual or budgeted. Actual costs are the real costs of acquiring goods and services, and budgeted costs, are estimated costs that will be incurred in the future. However, cost is a different term from expense. As it has already been mentioned costs are monetary measurements of used resources in producing products or offering services. But, Expenses are those costs which have already happened and are deducted from revenue. The remaining unused costs are counted as assets. To clarify this, depreciation expense is used as an example. Depreciation on an asset such as a plant will be booked into the profit and loss account and the remaining cost of the plant will be counted as an asset in the balance sheet. (Arora 2009.) Costs can be further classified into Direct and Indirect (Drury 2008, 28).

To determine the cost of services and products companies must be able to classify and distinguish costs based on their nature. Costs can be classified as direct and indirect, regarding the cost object. A cost object is anything that requires a separate measurement. Direct costs such as direct materials and direct labors are costs that are traceable to the cost object. While indirect cost such as indirect materials and indirect labors are related costs to cost objects, but they cannot be traced directly to cost objects. (Braun & Tietz 2013, 53.) Figure 4 illustrates cost assignment to a cost object.

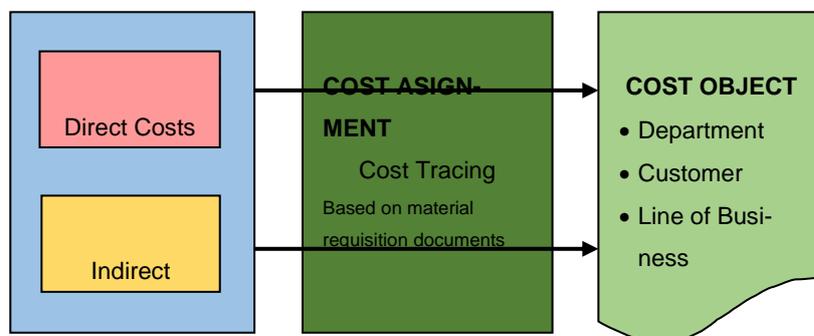


Figure: Cost assignment to a cost object (Horngren & al. 2012, 51)

However, for making proper decisions cost behavior and changing pattern must be understood by managers. Cost behavior can be divided into three categories: Variable costs, Fixed costs, Mixed costs. (Horngren & al. 2014, 60.) Figure 6 illustrates variable and fixed costs. Variable costs change in direct proportion of changes in the amount of total activity or volume. Despite, changes in total variable cost, they remain the same per unit. (Braun & Tietz 2013, 320.) Fixed costs do not change in direct proportion of changes in the amount of total activity and volume in a given period, but direct fixed costs are not con-

stant per unit. So increasing the volume decreases the amount of fixed cost per unit and decreasing the volume increases the fixed cost per unit. (Braun & Tietz 2013, 323.)

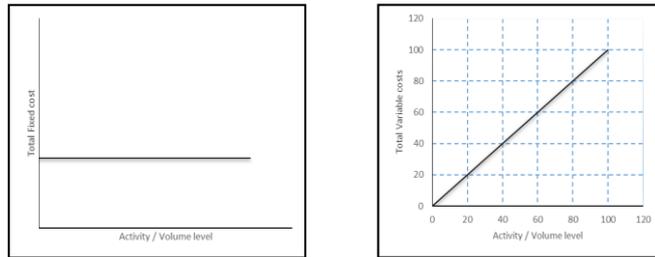


Figure 3: Variable & Fixed costs (Braun & Tietz 2013, 320,323)

Figure 7 illustrates mixed costs as a combination of variable and fixed costs. In these types, fixed costs remain the same, but variable costs change in the relevant range of activity or volume level. Therefore, by increasing the number of activities or volume, the total mixed costs increase as variable costs increase and they decrease because the fixed costs' components remain the same. (Braun & Tietz 2013, 325.)

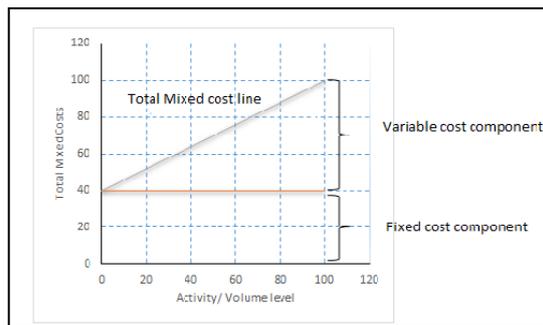


Figure 4: Mixed Costs (Braun & Tietz 2013, 325)

2.5 Elements of Cost

Material, labor and expenses are three elements forming a cost which can be direct or indirect (Arora, M 2009, 214).

Material Cost is the cost of supplying goods and materials of products or services. Those material costs that can be traced directly to a cost object such as Leather in shoes, Steel in Machines etc. are called *Direct Materials*. There are materials directly used, which are not considered in this category because of difficulty in measuring e.g. nails, they are considered to be *indirect materials*. There are however materials which are difficult to be traced directly to cost units or objects as they may not be very important or not used in the finished products or services. (Arora, M 2009, 214.)

Labor Cost is the cost of employees working in the organizations such as wages, salaries, commissions, bonuses etc. Those labor costs can be traced directly to a cost object for converting raw materials to products or services which are called *Direct Labors* such costs can be Machine operator, Shoe-maker, direct consulting and so on. There are however *Indirect Labors* which are more general and cannot be traced to cost objects examples can be supervisor, cleaner clerk etc. (Arora, M 2009, 214.)

There are other costs such as national costs of assets and service costs which are not included into labor cost and material cost. These costs are identified as *Expenses* and can be defined as *Direct Expenses* which incurs particularly for a cost object and are traceable and *Indirect Expenses* that are difficult to be traced directly to a cost object. Usually these types of expenses are common to all cost objects (Arora, M 2009, 214.)

2.5.1 Overheads

Overheads are the summation of all indirect costs and they can be classified based on Functions, Elements and Behavior (Arora, M 2009, 215).

There are four types of functions used to classify overheads. Production overhead refers to indirect costs of operations in producing products which are not clear like direct costs of production e.g. depreciation, consumed energies, indirect wages. Administration overhead refers to indirect costs such as controlling, administrating costs which are not traced directly to the cost objects e.g. General management's salary, legal expenses, calls etc. Selling overhead refers to the indirect costs of promoting and demand creating such overheads can be travelling expenses, bad debts and etc. Distribution Overhead refers to such indirect costs related to distributing finished goods or services to final customers. (Arora, M 2009, 215.)

Overheads can be classified based on the Elements and origins of expenses as well. The classification is made based on the Indirect Materials, Indirect Wages and Indirect Expenses. Moreover, overheads can be classified based on the Behavior of the costs which are Fixed, Variable and Mixed. (Arora, M 2009, 215.) These terms have been already explained.

2.6 Sources of data collection

Information can be obtained by interviewing people who are directly involved in performing activities, using general ledger (Income statement) to get elements of cost and IT system which has all the required measurements and information about cost object. These sources will be used to create an ABC system. Collected data is used to identify activities, elements of cost, cause and effect relationship determination and identifying accurate cost drivers for allocating expense resources to activities and activity costs to cost objects. (Institute of Management Accountants 2006.)

2.7 Key components of Activity-Based Costing

Key components of Activity-Based Costing are Expenses resources, Cost drivers, Activities, Activity drivers and Cost objects (Bahub 2010).

Expense resources are means and resources consumed by activities to achieve the goal. They can be categorized and grouped in a logical way to form cost pools. (Bahub 2010, 2.) Example of Expense resources are Administration, Depreciation, Rent & utilities, Office expenses, Transport, Advertising, etc. (Roztocki & al. 2004).

Cost drivers are assessment indicators of the usage level of expense resources by activities. Cost drivers must be different for each costing pool otherwise it is possible to combine costing pools (Bahub 2010, 4.)

Activities are performed by people in an enterprise to add value to products and services for serving customers and meeting their requirements (Investopedia 2015c). Therefore, activities consume resources which are manageable. Each activity consists of certain tasks representing the logical process model of the business. Moreover, to achieve a goal related and interrelated activities are grouped together to form a process. (Bahub 2010, 4.)

Activity drivers are assessment indicators of activities' usage by cost objects. However if activity drivers are the same for some activities it is possible to combine activities (Bahub 2010, 4.)

Cost objects can be anything such as customers, departments, processes, etc. that use activities performed in an organization (Bahub 2010, 4).

2.8 Implementation Guidelines and Steps

The refined costing system (Activity-Based Costing) can be implemented by following the three guidelines and seven steps (Horngren & al. 2012).

Required guidelines are (Horngren & al. 2012, 168):

- 1- *Tracing direct costs*: By identifying all relevant direct costs the amount of indirect costs classification will be minimized.
- 2- *Creating Indirect cost pools*: the aim is to gather indirect costs and create homogeneous cost pools as many as possible. Homogeneous cost pools have a cause and effect relationship with one of the cost drivers which will be used as the cost allocation base.
- 3- *Identifying Cost allocation bases*: cost drivers are used as cost allocation bases for every single homogeneous cost pools.

Required implementing steps are (Horngren & al.2012, 172):

- 1- *Identifying cost objects*: in this step cost objects must be identified based on the company's goal of calculating costs and allocating overheads.
- 2- *Identifying direct costs of cost objects*: in this step direct cost related to cost objects are identified so there is no need for them to be allocated by using allocation bases. Direct cost such as e.g. material cost, labor cost, maintenance costs, etc. can be identified by analyzing financial statements (Roztocki 2001).
- 3- *Identifying activities and allocation bases for allocating indirect costs to cost objects*: in this step activities are identified by analyzing the business process (Roztocki & al. 2004). Cost allocation base provides reliable data and measurement information about grouping homogeneous activities and costs which have the same cost drivers. If obtaining data for the measurement is difficult, other complex measurements might be used. (Horngren & al. 2012.)
- 4- *Identifying indirect costs of activities*: in this step overheads (Indirect costs) are assigned to activities based on the cause and effect relationships between cost allocation bases of costs and activities, however the relationship varies from one cost pool to another. Table 2 can be used to identify indirect costs of activities. The sign X in this

table illustrates the cause and effect relationship between expense resources and activities. (Roztocki & al. 2004).

Table 2: Identifying Indirect Cost of Activities (Roztocki & al. 2004)

Expense Resources	Activities			
	<i>A 1</i>	<i>A 2t</i>	<i>A 3</i>	<i>A 4</i>
<i>E 1</i>	x	x	x	x
<i>E 2</i>	x	x	x	x
<i>E 3</i>	x	x	x	x
<i>E 4</i>		x		
<i>E 5</i>	x	x	x	x
.	x	x	x	x
.				x
.				x

- 5- *Computing the rate per unit of cost allocation bases*: here the indirect costs' rate per unit are calculated by dividing the related indirect cost to the quantity of cost allocation base.
- 6- *Computing indirect costs for each cost objects*: in this step the calculated indirect costs' rate are allocated to cost objects based on their usage of activities through activity drivers.
- 7- *Adding direct and indirect costs of each cost object*: in this step the calculated direct and indirect costs are summed up to get the total cost of cost objects.

3 Implementing ABC to the company X

This chapter explains the implementation process and testing the tool at the same time. Tables are generated with manipulated numbers from income statement and interviewing the Manager of the company.

The process begun with interviewing the general manager of the company, to understand the company's structure and requirements from the tool and the refined costing system. There were four meetings which each of them last for 2 hours. After the first meeting the process of gathering information and creating theoretical framework started. The other three meeting sessions were about checking the outcome of analysis, informing the manager about the progress of the processes and requiring more information. In order to understand the topic and creating theoretical framework a desktop study was conducted. Then all information related to the topic was gathered and analyzed according to the ABC implementation steps and requirements of the company. Afterward by analyzing gathered data the required theories for creating an Activity-based costing system tool were picked up and the goal of the project which is "understanding the cost structure and its relevancy to operating places" were defined clearly.

3.1 Discussion

It has already been mentioned that the company is in the business of providing evening after school services for children and is a sub-contractor of the municipality Y. The operations are performed in six different places and there is a main office from where all the other places are managed. Activities of the company can be divided into instruction activities taken place in operating places and supporting managerial activities performed in the main office. The activities performed in operating places are to instruct children and considered to be direct activities related to providing the service. Therefore, activities taking place in the main office are considered to be Indirect activities. All activities are consuming certain types of costs whether direct or indirect. This project aims to allocate costs occurring in the main office which are considered to be overheads (Indirect costs) to each operating places to understand the real cost of running them and consequently analyzing profitability of places and their contribution to the total revenue.

When the municipality Y decides to offer a school with such a service, it will request proposals from different service providers such as the case company. Therefore each firm provides the municipality with their proposals including types of services (Activities to entertain and taking care of children) and quality of their services.

Over the past few years the company has expanded from one operating place with two people to the current 6 operating places (Clubs) with 25 staffs and a main office. Revenues from each operating place varies regarding the number of children, types of services required such as services for normal students or special students as well as the amount of the part-time or full-time customers.

Once providing services to an operating place is given to the company, managerial team (consists of the owner and general manager) starts planning process to run the place. Planning is necessary for budgeting, recruiting, identifying activities, required facilities and etc.

By starting the educational season in the middle of August the managerial team in the main office gets engaged with more activities in order to provide sufficient services to each one of the places at hand. The performance of clubs is monitored on the daily basis through responsive instructors (Director). Usually each club has one director plus other instructors which the number is dependent on the amount of children in the club. The company not only records working hours every day but also checks inventory to see if anything is needed to be added in the purchase list. Moreover, accounting activity is involved with some other tasks such as invoicing customers and municipality, twice a year, payroll, bill paying, as well as sending information to tax office and the Insurance company. Therefore, the total working hours spend on accounting activity is 684 hours for two personnel per year. The tasks, crew size and require working hours are in the Table 3.

Table 3: Accounting Activity

<i>Tasks</i>	<i>Hours per year</i>	<i>Crew size</i>	<i>Total</i>
<i>Invoicing</i>	8 h	1	8 h
<i>Payroll</i>	72 h	1	72 h
<i>Bill Payment</i>	60 h	1	60 h
<i>Inventory Checking</i>	80 h	2	160 h
<i>Other Accounting Activities</i>	192	2	384 h
<i>Total Working hours</i>			684 h

The procurement activity is needed to provide supplies and equipment required by the operating places and the main office. There are four types of materials to be purchased. Equipment and electronics are required to be bought once a year which takes 16 working hours. Food supplies are purchased two times a week equivalent of 10 working hours which will be 410 hours for one year. Books, toys, magazines and craft supplies are pur-

chased 2 times a year equal to 32 working hours and moreover inventorying the purchased products requires 160 working hours for one person however there are 2 personnel required in purchasing the food & material supplies and Inventorying. Purchasing of office supplies requires one working hour per month so it is about 12 hours for the whole year. The purchased materials and supplies are stored in the main office and uses 60 % of the office, therefore the other 40% remains for managerial activities. Supplies will be delivered to each Operating Place based on their requests. Delivery is assumed to take 2 hours per delivery. The tasks, crew size and required working hours are in the Table 4.

Table 4: Procurement Activity

<i>Tasks</i>	<i>Hours per year</i>	<i>Crew size</i>	<i>Total</i>
<i>Equipment & electronics</i>	16 h	1	16 h
<i>Food supply</i>	410 h	2	820 h
<i>Office Supply</i>	12 h	1	12 h
<i>Toys, Books, Magazines, craft supplies</i>	32 h	2	64 h
<i>Inventory</i>	160	2	320 h
<i>Total Working hours of the activity</i>			1232 h

Human resources activity is another service which company provides for operating places. Tasks in this activity can be daily, monthly or even annually. In this activity the main office is engaged with providing substitution which takes 201 hours, interpersonal problem solving takes 656 working hours and preparing timetable, Hiring and firing, internship issues and other issues which requires 90 working hours all together. The total working hours for two personnel of the main office will be 1906 hours. Table 5 illustrates the tasks and working hours.

Table 5: Human resources Activity

<i>Tasks</i>	<i>working hours per Year</i>
<i>Providing substitution</i>	207 h
<i>Preparing time table</i>	10 h
<i>Interpersonal problem solving</i>	656 h
<i>Hiring & Firing</i>	20 h
<i>Internship issues</i>	20 h
<i>Other issues regarding Employees</i>	40h
<i>Crew Size</i>	2
<i>Total Working Hours</i>	1906 h

Transportation activity is required to deliver supplies to operating places and purchasing of the supplies. Another purpose is to deliver employees from one place to another because of meetings for instance with families and municipality or internal meeting of the company.

The educational season will end on 31 May. Then it is time to close the books, and to open a new book for the next educational year. During the summer the operating places are closed but the main office is open and the owner and the general manager are working on planning, scheduling and other business related issues. All of other possible activities like dealing with the municipality, banks, insurances and others are considered to be included in General & Administration activity pool.

3.2 Cost and cost behavior of the company

Regarding the operations and providing services, different types of costs incur in the company. Costs of the company are categorized based on the elements of costs which are Material, Labor and Expenses. Elements of Costs can be *Direct* or *Indirect*.

Direct costs are those that can be traced back directly to the operating places and Indirect Costs are those costs incurring in the main office. It is important to mention some costs such as interests and taxes as well as fixed material costs such as furniture, computers, and mobile phones, snack dining, car, toys, books and magazines are not included into the calculation of overheads to operating places. Those costs are business costs and are not periodically used but they can get depreciated which is used into the calculations (Hicks 1999, 34).

Table 6: Cost Elements

<i>Expenses</i>	<i>Material Cost</i>	<i>Labour Cost</i>
Depreciation	Equipment	Salaries
Marketing	Computers & Software	Wages
R&D	Snack Dining	Social Security
Membership	Furniture	Insurances
Phone Calls	Mobile Phones	
Internet	Car	
Post costs	Toys, Books, Magazines	
Voluntary Personnel costs	Office Equipment	
Gift	Supplies	
Transportation	Food Supplies	
Taxi	Craft Supplies	
Parking	Office Supplies	
Rent & Utilities		
Office Rent		
Cleaning & Sanitation		
Electricity & Gas		
Building Insurance		
Interest & Taxes		

As it is shown in table 6, costs are categorized further into Supplies (Food, Office, craft and Other), Salaries & Wages (salaries, wages, social security costs, person insurances), Depreciation, Transportation, Call & Internet, Rent & Utilities (Office rent, Cleaning & Sanitation, Electricity & Gas, Building Insurance), G & A (marketing, Membership, Financial Services, Taxi cost, Parking cost, R&D, Post costs) and Voluntary Personnel costs (Gifts, Entertainment costs, leisure activities, working cloths).

3.3 Implementation Steps and Designing the tool

In the following steps the result of gathered and analyzed information is explained. The steps are based on the chapter 2.6 “Key components of Activity- Based Costing” of the theoretical framework. For confidentiality reason the real figures are manipulated. Figure 7 shows the cause and effect relationship structure of the ABC system according to the implementation processes.

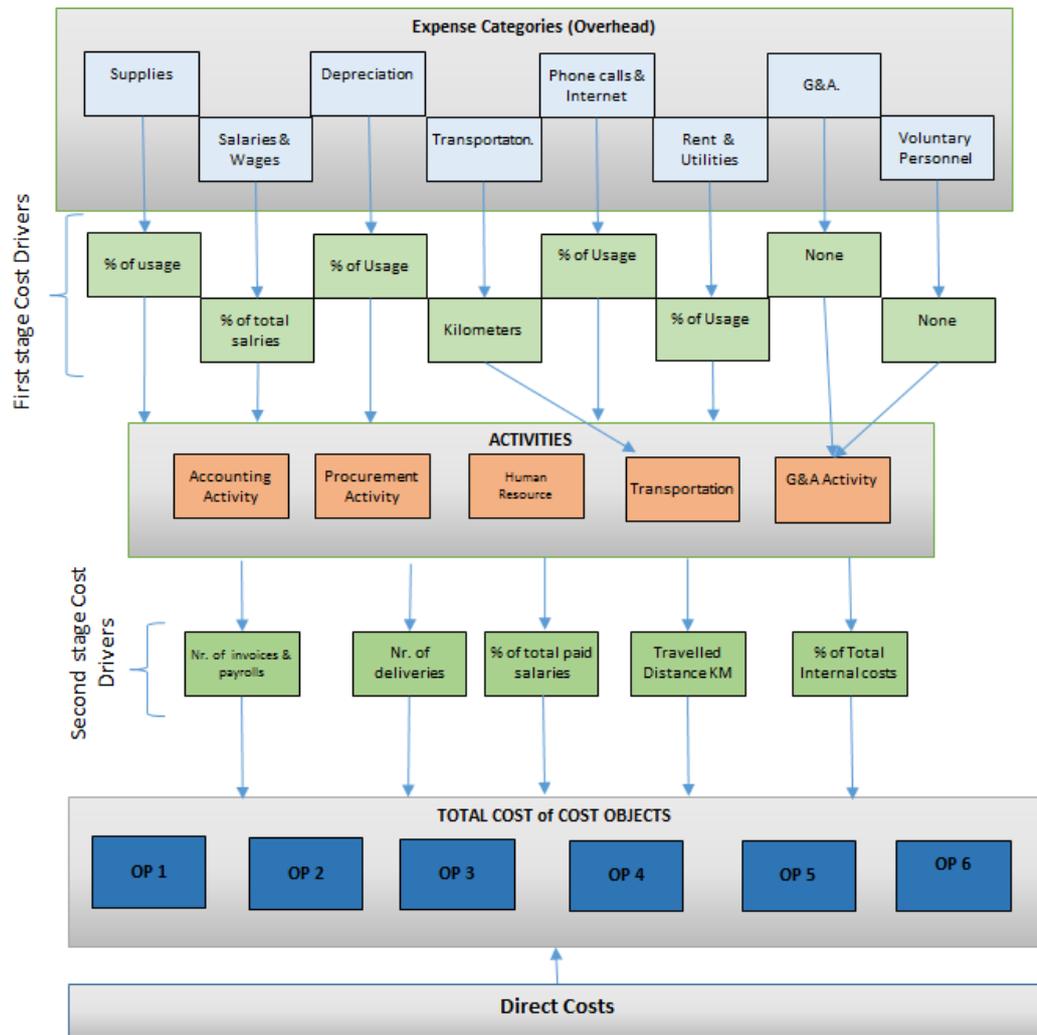


Figure 5: Expense Categories, Activities and Products relationship of The company (Horngren & al. 2012)

Before going any further, figures from income statement is required. Therefore the tool is started by Schedule # 1 which is illustrated in Table 7. It is designed based on the income statement format of the company.

In this schedule, the total revenue of the company for the year XXXX is 687,686 €. The total cost is 552,188 € which is 80 % of the revenue and the other 20% which is 135,498€ is Earnings before interest and tax.

Now we will continue to the implementation steps in the next pages starting by identifying Cos objects.

Table 7: Income Statement

Income Statement	Year XXXX	Schedule #1
<i>Company X</i>	€	% of Total Revenue
Turnover	687,686	
Club Income	266,104	
Grands	421,582	
Total Material Cost	6,728	1%
<i>Supplies</i>	<i>6,728</i>	
Food Supplies	3,744	
Craft Supplies	468	
Office Supplies	2,516	
Total Salaries & wages	497,750	72%
Salaries	160,000	
Wages	229,182	
Social Security	108,568	
Insurances		
Total Expenses	47,710	7%
<i>Depreciation</i>	<i>2,280</i>	
<i>Transportation</i>	<i>14,165</i>	
<i>Rent & Utilities</i>	<i>12,642</i>	
Office Rent	12,279	
Cleaning & Sanitation	363	
Electricity & Gas	-	
Building Insurance	-	
Phone Calls & Internet	10,770	
<i>G &A</i>	<i>7,853</i>	
Financial service cost	207	
Marketing	1,623	
R&D	602	
Membership fees	1,302	
Post costs	95	
Taxi	52	
Parking	-	
Total Voluntary Personnel costs	3,972	
Entertainments and leisure	164	
Gift for personnel	-	
Voluntary Personnel costs	3,808	
Total Costs	552,188	80%
EBIT	135,498	20%

3.3.1 Identifying Cost objects

Cost objects can be whether the operating places, customer groups or an individual customer. In this case Operating Places are identified as cost objects according to the consultation with the thesis advisor and the requirements of the company. Currently the company is running 6 Operating Places (Ops). Table 8 illustrates Schedule #3.1 which provides information regarding the number of personnel, children, number of payrolls and invoices, direct working hours and total distance Km of the Operating Places. The information in this table will be used in the later calculation of assigning costs to activities and cost ob-

jects. It is assumed that all together there are 17,000 working hours, 180 payrolls, 54 deliveries and 414 travelled distance Km.

Table 8: Operating Places' Info

Operating Places' Info & Direct Costs							Schedule# 3.1
Company X							
	No. Of Children	No. of Employees	Direct Working Hours	No. of Invoices	No. of Payrolls	No. of Deliveries	Total Distance km
OP #1	60	4	3 600	240	36	12	120
OP #2	30	2	2 000	120	18	6	54
OP #3	82	6	5 467	328	54	12	96
OP #4	15	1	1 000	60	9	6	42
OP #5	59	6	3 933	236	54	12	72
OP #6	15	1	1 000	60	9	6	30
Total	261	20	17 000	1 044	180	54	414

3.3.2 Identifying Direct Costs of Cost objects

Direct costs for all the places are identified by analyzing income statement and interviewing the General Manager of the company. The result of the income statement analysis shows that 20% of the total revenue is earning before interest & Tax (EBIT) and 80 % is total expenses. Direct costs are considered to be transportation, depreciation, supplies and salaries & wages. As the only available information was income statement, direct cost of the OPs must be calculated by certain calculation. Direct costs are calculated based on certain assumptions which are changeable so the user can use real figures. However, if figures for direct costs are available there is no need to go through these calculations and they can be entered directly to schedule # 3 to 3.1 which can be used in the further calculations.

It is assumed that the total year travelled distance is 1,500 km, Total Distance of Ops from the main office is 45 kilometers, total amount of delivery is 54, total assets is 10,000 € from which 8,000 € is for Ops, 10% of food supply and 20% of office supply is used in the main office, Average hourly salary is 17 €. Direct calculation Schedules # 2, 2.1, 2.2, 2.3 are created in the tool for calculating direct costs. Table 9 illustrates Schedule # 2 which calculates direct transportation's cost of Ops.

Table 9: Direct cost calculation (Transportation)

Direct Cost Calculation Company X		Schedule # 2		
Transportation				
Transportation € (Mileage from Income statement)				14,165
Year beginning Km				120,000
Year End Km				121,500
Total Year Km				1,500
€/Km				9.44
	Distance Km From Main Office	No. Of Deliv- eries	Total Dis- tance Km	Total Cost €
Total	45	54	414	3,910
Main Office			1,086	10,255

The following formulas are used in this schedule in order to calculate direct transportation costs of Ops:

- Total Year Km = Year End Km – Year Beginning Km
- €/Km = Transportation € / Total Year Km
- Total Distance Km = No. deliveries X Distance from MO
- Total Cost € = Total Distance Km €/Km
- Total MO distance Km = Total year Km –Total Distance Km
- Total MO Transportation € = Transportation €- Total Cost€

Another direct cost which must be calculated is Depreciation. Currently the company does not have information regarding the depreciation of its equipment in different places and the only figure available is the one in the income statement which is calculated by using straight line method on a 3 years base. Depreciation could not be used as overhead as each place has different amount of equipment with different values regarding the number of children. So it will not be accurate to consider depreciation as an overhead. This schedule is created to calculate the amount of depreciation for each place and the rest will be used to the main office which we consider its costs as the overheads.

Table 10: Direct Cost Calculation (Depreciation)

Direct Cost Calculation		Schedule # 2.1	
Company X			
Depreciation			
Total Depreciation € (Planned Depreciation from Income statement)			2280
Total Assets €		10000	
	Assets Value €	% of Total Assets	Depreciation €
OP #1	1 839	18 %	419
OP #2	920	9 %	210
OP #3	2 513	25 %	573
OP #4	460	5 %	105
OP #5	1 808	18 %	412
OP #6	460	5 %	105
Total	8 000	80 %	1 824
Main Office	2 000	20 %	456

Formulas used in Schedule # 2.1 are:

- % of Total Asset = Asset value € / Total Assets €
- Depreciation € = % of Total Asset x Total Assets
- Main office Asset Value = Total Assets – Total Asset values
- Main Office Depreciation € = Total Depreciation € Planned – Total Depreciation €

Schedule # 2.2 illustrated in the table 11 is created to calculate the amount of supplies of operating places. We cannot consider supplies as indirect costs because the cost objects are operating places and supplies are sent directly to them. At the moment the company does not trace the amount of supplies being sent to the places. So we ought to calculate direct supplies based on some assumptions. It is assumed that 10 % of food 374 € and 20 % of office supplies 503 € are used in the main office and the rest is divided between operating places (The assumptions are changeable by user). The result shows that 5,850 € of supplies is left for operating places. Food supplies and crafts are divided based on the number of children and office supplies are divided based on the total amount of persons (No. Children + No. Employees) of the places. The result of the calculation shows that cost of supplies per person as: office supplies 7 €, food supplies 13 € and craft supplies 2 € per children. Total amounts are available in the table.

Table 11: Direct Cost Calculation (Supplies)

Direct Cost Calculation					Schedule # 2.2	
Company X	€	Main Of- fice %	Supplies		€/ Children	€/ Per total Per- sons
			Main Office €	Supplies of Ops		
Food	3 744	10 %	374	3 370	13	
Craft	468		-	468	2	
Office	2 516	20 %	503	2 013		7
Total	6 728	13 %	878	5 850	15	7
	No. of Children	No. of employees	Food Supply €	Craft Sup- ply €	Office Sup- ply €	Total Supplies €
OP #1	60	4	775	108	458	1 341
OP #2	30	2	387	54	229	670
OP #3	82	6	1 059	147	630	1 836
OP #4	15	1	194	27	115	335
OP #5	59	6	762	106	466	1 333
OP #6	15	1	194	27	115	335
Total	261	20	3 370	468	2 013	5 850

Formulas used in Schedule # 2.2 are:

- Main office € = Main office % x Total € of supplies
- Supplies of OPs = Total € - Main office €
- €/ Children = Supplies of OPs / Total number of Children
- € Per total persons = Supplies of OPs / Number of total persons
- Supplies € of OPs = € per total persons x No. of Children or Total persons of OPs

Next is to calculate direct salaries and social security of the places. As the company did not give the exact direct salaries and the only means of getting information was income statement schedule # 2.3 illustrated in table 12, is created to calculate this direct cost based on an assumption that the total average hourly salary is 17 €. The 28 % of the social security is attained from the income statement by dividing the total social security to the total salaries paid. Then the result of the average hourly salary is multiplied by the 17,000 total working hours of places in the schedule # 3.1. So the total amount of direct Salaries and social security is considered to be 285,600 € and 79,672 € respectively. The remaining amount of 103,582 € of salaries and 28,896 € of social security are overheads.

Table 12: Direct Cost Calculation (Salaries & Social security)

Direct Cost Calculation		Schedule # 2.3	
Company X	Salaries & Social security		
Average Hourly Salary €			17
Social Security (% from Salaries Paid)			28 %
	Total Hours Worked	Total Salaries €	Total Social Security's €
OP #1	3 600	60 480	16 872
OP #2	2 000	33 600	9 373
OP #3	5 467	91 846	25 622
OP #4	1 000	16 800	4 687
OP #5	3 933	66 074	18 432
OP #6	1 000	16 800	4 687
Total	17 000	285 600	79 672
Main Office €		103 582	28 896

Formulas used in Schedule # 2.3 are:

- Social Security % = Total social security (Schedule # 1) / Total Paid Salaries (Schedule # 1)
- Total Salaries € = Total Hours worked of OPs x Average Hourly Salary €
- Total Social security of OPs = Total Salaries € of OPs x Social security %
- Main office = Total Salaries paid (Schedule #1) - Total salaries € of OPs
- Main office = Total Social security (Schedule #1) - Total Social security € of OPs

Schedule # 3 is created to collect information related to direct costs of OPs. Figures in this schedule can be used from the previous direct calculations or directly entered by the user if the company has actual data. As it is shown in table 13 direct costs such as salaries & wages, social security, supplies, transportation and calls & internet are needed to calculate total direct cost of operating places. To mention that the euro amount of calls & internet is obtained based on an assumption that all the operating places and main office are having an equal share of the total calls & internet in the income statement. The result of this Schedule will be reduced from the total cost of the income statement which will give us the costs of the main office.

Table 13: Operating Places' Info & Direct Costs

Operating Places' Info & Direct Costs							Schedule # 3
Company X	Salaries & Wages €	Social Security €	Supplies €	Transportation €	Depreciation €	Calls & Internet €	Total Direct Cost €
OP #1	60 480	16 872	1 341	1 133	419	1 539	81 783
OP #2	33 600	9 373	670	510	210	1 539	45 902
OP #3	91 846	25 622	1 836	907	573	1 539	122 321
OP #4	16 800	4 687	335	397	105	1 539	23 862
OP #5	66 074	18 432	1 333	680	412	1 539	88 471
OP #6	16 800	4 687	335	283	105	1 539	23 748
Total	285 600	79 672	5 850	3 910	1 824	9 231	386 088

After identifying direct cost, indirect costs must be assigned to activities. To do so activities and second stage cost drivers must be identified. This will be explained next.

3.3.3 Identifying activities and allocation bases for allocating indirect costs to cost objects

Based on the interviews and analysis of the business process, activities are categorized into five activity pools which are Accounting, Procurement, Human resources, Transportation and General & Administration which has already been explained in the Discussion chapter. Identifying activities' allocation bases are very difficult and there might be so many other ways. But the current used cost drivers are considered to be the most suitable ones because the activities' working hours will be effected by decreasing or increasing these cost drivers. However, they must be changed periodically by even further analysis of the company's activities. Table 14 illustrates activities and their allocation bases.

Table 14: Second Drive Cost Allocation Bases (Hicks 1999, 230)

ACTIVITIES	ACTIVITY ALLOCATION BASE
Accounting	Number of Invoices and payrolls
Procurement	Number of Deliveries
Human resources	% of total paid Salaries
Transpiration	Total Distance Km
General & Administration	% of Internal Costs

In accounting activity, the main tasks are dealing with people such as employees and children of the operating places therefore the intensity of work load depends on the total number of people in the places. As the numbers decrease the intensity of tasks to be done get decrease and vice versa. Imagine that instead of 286 people who the owner and manager are dealing with during the year there were 100 people therefore fewer invoices will be sent, fewer payrolls will be paid and so on. The best choice as a cost driver is total number of Invoices and payrolls. Based on the data gathered from interviews the company sends invoices to customers and municipality 2 times pay year and pays payrolls each month during the educational year.

Identifying cost driver for procurement activity is a bit challenging. Usually for this type of activity pool the percentage of the direct purchased material used for the cost object is used as the cost driver (Hicks 1999). But in our case the amount of direct materials or supplies used for each place is not that much to be used as the driver. The only option at this point is the number of deliveries. As more deliveries require more purchasing efforts to buy supplies so it uses higher amount of time or percentage of cost used in this activity.

The Human resources activity will be allocated to cost objects based on the percentage of the total salaries paid because more employee requires more efforts in performing the tasks in this activity. Total distance Km will be used as the driver for transportation activity because the more distance in kilometer travelled the higher the cost will be. In General & Administrative activity the percentage of the internal cost is used as it is the most common way for assigning costs of this kind of activity pool to cost objects (Hicks 1999, 90).

3.3.4 Identifying costs of activities

Table 15 illustrates the relationship between activities and Expense Resources which are costs of the Min Office.

Table 15: Identifying Costs of Activities

<i>EXPENSE RE-SOURCES</i>	<i>ACTIVITIES</i>				
	Accounting	Procurement	HR	Transportation	G & A
Supplies	X	X	X		X
Salaries & Wages	X	X	X		X
Depreciation	X	X	X		X
Transportation		X		X	
Call & Internet					X
Rent & Utilities	X	X	X		X
G& A					X

Expense categories are identified to different activities based on their cause and effect relationship (Hicks 1999). Supplies, Salaries & Wages, Depreciation, Call & Internet and Rent & Utilities are used by all the activity pools. So the cross “X” shows which expenses are used by activities. If one of the resources is used by all activities, then the percentage of usage differs for activities. Moreover, there are expenses which are related to one particular activity pool such expense resources are Transportation, G & A, and Voluntary Personnel Cost. Transportation is totally assigned to transportation activity. G & A cost is the expense resource that allocated totally to G & A activity pool as those were assumed to be used for other purposes and no other identified activities.

Schedule # 5 is created to accumulate costs of activities by giving the percentages of usages. Cost drivers of resource expenses and percentages of usages are illustrated in table 16. Current percentages in the table are assumptions based on which expense resources are divided among activities. The first stage cost drivers are defined based on the types and intensity usages of expenses. As most of the activities are performed by a certain number of people and there is no actual working hours for staff in the main office allocation based on the working hours is not possible. So the percentage of usage for assigning expenses to activities is used.

Table 16: Accumulating Costs % of Activities

Accumulating Costs % of Activities		Schedule # 5				
Company X						
	Cost Driver	Accounting	Procurement	HR	Transportation	G&A
<i>Total Salaries & Wages</i>	% of paid salaries					
Monthly based Salary	100%	30%	15%	40%		15%
Hourly based Wages	100%				100%	
Social Security	xxxxx					
<i>Total Materials & Supplies</i>	% of Supplies					
Food	100%					100%
Office	100%	35%	10%	20%		35%
<i>Total Expenses</i>						
Depreciation	Usage % of depreciation	20%	10%	40%	20%	10%
Rent & utilities	% of Total rent & Utilities	20%		20%		60%
Transportation	% of Total Distance Km				100%	
G&A	% usage of G&A					100%

After getting the expenses' percentages of usage, they must be applied to activities. Schedule # 6 illustrated in table 17 is created for this purpose.

Table 17: Identifying Activity Drivers & Accumulating Activities' Cost (Indirect Costs)

Identifying Activity Drivers & Accumulating Activities' Cost (Indirect Costs)							Schedule # 6
Company X							
	Cost €	Accounting	Procurement	HR	Transportation	G&A	
<i>Total Salaries & Wages</i>	<i>132,478</i>	<i>39,743</i>	<i>19,872</i>	<i>52,991</i>	-	<i>19,872</i>	
Monthly based Salary	103,582	31,075	15,537	41,433	-	15,537	
Hourly based Wages		-	-	-	-	-	
Social Security	28,896	8,669	4,334	11,558	-	4,334	
<i>Total Materials & Supplies</i>	<i>878</i>	<i>176</i>	<i>50</i>	<i>101</i>	-	<i>551</i>	
Food	374	-	-	-	-	374	
Office	503	176	50	101	-	176	
<i>Total Expenses</i>	<i>32,745</i>	<i>2,620</i>	<i>46</i>	<i>2,711</i>	<i>10,347</i>	<i>17,022</i>	
Depreciation	456	91	46	182	91	46	
Rent & utilities	12,642	2,528	-	2,528	-	7,585	
Transportation	10,255	-	-	-	10,255	-	
G&A	9,392	-	-	-	-	9,392	
Phone Calls & Internet	1,539						
Total Activity Cost	166,100	42,539	19,968	55,803	10,347	37,445	

In this schedule indirect costs € of the main office can be obtained from reducing direct costs identified in schedule # 3 from total costs in income statement in schedule #1. Then the percentages provided in schedule # 5 is multiplied by the related expense resources' percentages to get the euro amount of the activity pool from that expense recourse. Now that we have the total activity costs, the rate per units of cost driver must be calculated.

Formula used in this schedule is (Horngren & al. 2012):

$$- \text{Activity cost} = \text{Expense resource \% (Schedule \#5)} \times \text{Cost €}$$

3.3.5 Computing the rate per unit of cost allocation bases

Cost rate per unit of drivers is calculated at bottom of the schedule # 6 and the result is shown in table 18. To compute the rate per unit of expense resources to activity pools (First Drive Allocation) the following formula is used (Horngren & al. 2012):

$$\text{Rate per Unit} = \text{Total Activity cost} / \text{Cost Driver Total Units}$$

Total cost drivers are used from schedule # 3 and # 3.1 by which the total activity costs are divided. As it is shown in the table 18, the rate per each payroll and invoice is 35 €, each delivery cost 370 €, the total cost of human resources activity is equal to 15 % of the total salaries and wages paid, 25 € is spent on each traveled kilometers and total G&A is equal to 29 % of the total internal costs. Total Internal costs is the summation of accounting, procurement, human resources and transportation activities' total costs.

Table 18: Computing the rate per unit of activity cost

Activities' Cost Drivers	Number of Payrolls & Invoices	Number of Deliveries	% of Total paid salaries & Wages	Total Distance Km	% of Internal Costs
Total Cost drivers	1,224	54	365,272	414	128,656
Rate per Unit of Cost Driver	35	370	15 %	25	29 %

3.3.6 Computing indirect costs of cost objects

Schedule # 7 illustrated in table 19 is created to calculate and assign activity pools' costs to cost objects. In this schedule indirect cost of operating places is calculated by using the rates of activities calculated in schedule # 6 in table 18 and number of cost drivers in schedule # 3 and # 3.1 in tables 8 and 9 respectively. It can be seen that all the 166,100 € indirect cost is allocated to all cost objects.

Formulas used in this schedule are (Horngren & al. 2012):

$$\text{Overhead} = \text{Activity Cost rate (€ or \%)} \text{ per Unit} \times \text{Number of Unit Drivers}$$

- Total Overhead = Accounting Overhead + Procurement Overhead + Human resources Overhead+ G&A overhead

Table 19: Allocating Activities' cost to Cost objects

Allocating Activities' cost to Cost objects						Schedule # 7
Company X						
	Accounting	Procurement	HR	Transportation	G&A	Total Place Cost €
Rate	35 €	370 €	15%	25 €	29%	
OP #1	9,592	4,437	11,817	2,999	8,395.30	37,241
OP #2	4,796	2,219	6,565	1,350	4,345.08	19,274
OP #3	13,276	4,437	17,945	2,399	11,076.56	49,135
OP #4	2,398	2,219	3,283	1,050	2,604.50	11,553
OP #5	10,079	4,437	12,910	1,799	8,505.90	37,731
OP #6	2,398	2,219	3,283	750	2,517.22	11,166
Total Activity	42,539	19,968	55,803	10,347	37,445	166,100

3.3.7 Adding direct and indirect costs of each cost object:

Table 20 illustrates Schedule # 8 which is to sum up direct and indirect costs to get the total costs of operating places and to calculate earnings before interest and tax. As relevant information of the incomes of operating places was not available, the club income and grands for the purpose of calculation is obtained by dividing the total club income and grands in income statement in schedule # 1 by the total number of children in schedule # 3.1. The result is then multiplied by the number of children in each place. However, the real figures for total revenue can be used by the end-user. The formula used in this schedule are (Horngren & al. 2012; Investopedia 2015b):

- Total Cost = Direct Cost + Indirect Cost
- EBIT = Total revenue – total cost

Table 20: Total Cost & EBIT of Ops

Total Cost & EBIT of OPs						Schedule # 8
Company X						
	Club Income	Grands	Direct Cost	Indirect Cost	Total Cost	Earnings Before Interest & Taxes
OP #1	61,173	96,915	81,783	37,241	119,024	39,064
OP #2	30,587	48,458	45,902	19,274	65,176	13,869
OP #3	83,604	132,451	122,321	49,135	171,456	44,599
OP #4	15,293	24,229	23,862	11,553	35,415	4,107
OP #5	60,154	95,300	88,471	37,731	126,202	29,252
OP #6	15,293	24,229	23,748	11,166	34,915	4,607
Total	266,104	421,582	386,088	166,100	552,188	135,498

3.4 Profitability Analysis

Schedule # 9 illustrated in table 21 is created to calculate profitability of cost objects. In this schedule the required percentages to analyze Earnings Before Interest & Taxes percentages, and total cost percentages from the total revenue is provided. The Formulas used in this schedule are: (Hicks, D.T. 1999.)

- Revenue % from total revenue = Total revenue /Total revenues of all Ops x 100
- Cost % from Total Revenue = Total Cost / Total revenue of the place x 100
- EBIT from Revenue = EBIT / total revenue of the place x 100

Table 21: Profitability Analysis

	Total Revenue	Total Cost	Earnings Before Interest & Tax	Revenue % from total revenue	Cost % From Total Revenue	Earning % from total Revenue
OP #1	158,088	119,024	39,064	23%	75%	25%
OP #2	79,045	65,176	13,869	11%	82%	18%
OP #3	216,055	171,456	44,599	31%	79%	21%
OP #4	39,522	35,415	4,107	6%	90%	10%
OP #5	155,454	126,202	29,252	23%	81%	19%
OP #6	39,522	34,915	4,607	6%	88%	12%
Total	687,686	552,188	135,498	100%	80%	20%

3.4.1 Conclusion

The analysis of the income statement shows 80% of the cost can be directly traced to operating places. As it has been explained before in chapter 3.3 cost and expenses can be grouped into three main categories which are material cost, salaries & wages and Expenses. After dividing the totals of those categories by the total revenue of the company, it has been understood that salaries & wages represents 72 % of the total revenue which is the biggest source of expense of the company. Total expenses and material costs show 7% and 1 % of the total revenue.

Activity based costing tool allows users to simulate the profitability and cost by adding or eliminating contracts, changing labor hours or any other elements of costs to see the “what if” results (Hicks, D.T. 1999). “What if” analysis is used to test the result of financial and costing tools with under different assumptions and circumstances (Investopedia 2015d.)

Let's assume that the company would like to see what happens if it drops OP # 6 and gets another contract with the municipality. The result of the analysis in chapter 3.4 "profitability analysis" shows that the total revenue of OP # 6 is 39,522 € which is 1% from the total revenue of all places. The total cost of the place is 34,915 € which is 88 % of the place total revenue and EBIT is 4,607 € representing 12 % of the place total revenue.

It is assumed that the new place will have 216,055€ total revenue and 125, 971 € total direct cost. By applying the rates of schedule #6 in the table 17, to the new contract the total accumulate indirect cost will be 45,619.13 €, and the earnings before interest and tax will be 44,464.79 €. The total result of the calculation is showed in schedule # 10 in the Table 22. This schedule is created for what if analysis purpose.

Table 22: Schedule #10 What If Analysis

What If Analysis		Schedule# 10		
Scenario 1 Adding and eliminating OP				
Revenue	216055			
Club Income	83604			
Grands	132451			
		Direct Cost	Rates	Indirect Cost
Salaries & Wages €	91,486		15%	17,889.63
Social Security €	25,616			
Supplies €	5,850			5,850.00
Transportation €	907			907.00
Depreciation €	573			573.00
Calls & Internet €	1,539			1,539.00
No. Of Children	82			
No. of Employees	4			
Direct Working Hours	5,467			
No. of Invoices	240		35	10,009.17
No. of Payrolls	48			
No. of Deliveries	12		370	4,437.23
Total Distance km	120		25	2,999.03
G&A			29%	10,284.06
Total cost	125,971			45,619.13
EBIT				44,464.79

The schedule #10 continues with analyzing the effect of adding and eliminating OP in order to see whether if there will be a change in the costs and profitability or not.

Table 23: Adding and Eliminating OPs

	Total Revenue	Direct Cost	Indirect Cost	Earnings Before Interest & Tax	Revenue % from total revenue	Direct Cost % from total Revenue	Indirect % from total revenue	Earning % from total Revenue
Total Ops	687,686	386,088	166,100	135,498	100%	56%	24%	20%
Eliminate OP # 6	39,522	23,748	11,166	4,607	6%	60%	28%	12%
Total Without eliminated Op	648,164	362,339	154,934	130,891	75%	56%	24%	20%
Add new OP	216,055	125,971	45,619.13	44,465	25%	58%	21%	21%
Total	864,219	488,310	200,553	175,356	100%	57%	23%	20%
Difference	176,533	102,223	34,453	39,857	27%	28%	22%	30%

As it is shown in the Table 23 the result of reducing the figures of OP# 6 from the totals will be total revenue 648,164€, total direct cost 362,339 €, total indirect cost 154,934 and total EBIT 130,891 €. The percentages of the totals without OP# 6 shows that there would be no significant change in the result of the total costs which is still 80% of the total revenue and total EBIT which is 20%.

Next step is to add the new place to the calculation to see whether if the amount of cost and profit will change or not. By adding the amounts of total revenue 216,055 €, direct cost 125,971 €, indirect cost 45,619.3 € and EBIT 44,465 €, the new totals of the place will be: total revenue 864,219€; direct cost 488,310€; indirect cost 45, 619.13 € and EBIT 44,465€.

As it is shown in the table the final percentages do not change at all after adding the new places as total cost (Direct + indirect) still remains at 80 % of the total revenue and the EBIT is 20%. But if we were to calculate the difference between the totals before what if and after what if we can see that there is a 27% increase in total revenue which is 176,533 €, 28 % of direct cost equals to 102,223€, 22% of indirect cost equals to 34,453 € and 30 % changes in EBIT equals to 39,857 €. The increase in direct cost is quite natural as the company requires more staff in the place and the amount of supplies will increase by the number of children. The raise of indirect cost represents that whether the current staff of the main office must work over time or new staffs to be recruited specially for managerial activities.

From the total results after what if analysis it can be concluded that the company must revise its salaries & wages expenses if it intends to increase its profitability.

Formulas used in schedule # 10 are (Hicks, D.T. 1999):

- Indirect cost = Rate x Direct cost
- Total Cost = Direct cost + Indirect cost
- G&A = Rate x total internal cost
- EBIT = Total Revenue – Total Cost
- Total without eliminated OP = Total Ops – Eliminate OP# 6 (In this case)
- Total = Total without eliminate OP + Add new OP
- Difference = Total – Total OPs

4 Summary and personal learning

Creating an accurate cost information system is a fundamental need for organizations to be competitive in the market. However, it is not an easy job and requires time and investment to gather and analyze information to form the system. But companies can benefit by understanding the cost structure so they can make proper decisions about the costs, profitability, pricing and so many other issues. One of the commonly used and accurate costing system is Activity- Based Costing. As it was evident, the created ABC system tool helped the case Company to have a better idea of its operating places costing issues. After going through the process of creating the tool and analyzing the company's activities and business process, it is strongly recommended that the company use more tools such as budgeting, internal accounting, and so on in order to trace the incurred costs of the business.

Howbeit this tool can be improved even further and many other sheets can be added to the tool for collecting and analyzing data to provide more accurate results for decision making. Fields that can be added and improved are salary payment system, social security and insurance calculation system, inventory and purchasing system, other legal issues, calculation system and Activity Based Management system. Despite of Activity Based Costing Which is just a tool for calculating and allocating overheads to costs objects Activity based management helps the company to reform its costing system and provides managers with how to understand the result of the ABC system tool.

However, it is not possible to explain all of the learning and knowledge I gained by doing this project but I will mention some of the main ones.

- Planning: I realized that how it is important to plan a project beforehand and all the possible related issues must be identified and familiarized with to have a good plan.
- Timing: It is of fundamental importance to be precise and make a deadline for each step of the project plan.
- The importance of costing system: in the beginning creating a costing system looks easy as it is all about organizing information. But how to get information and which one is relevant is important therefore creating criteria for data selection is necessary in creating a tool. Companies may not have everything ready but they must be created by analyzing the whole business.
- Cooperating issues: although the case company was very cooperative in the process of doing this project but I understood what sort of difficulties one can go through if required support is not provided by the personnel and the company in general.

List of tables

Table 1: Project Tasks (PTs).....	2
Table 2: Identifying Indirect Cost of Activities (Roztocki & al. 2004)	16
Table 3: Accounting Activity	18
Table 4: Procurement Activity	19
Table 5: Human resources Activity	19
Table 6: Cost Elements.....	21
Table 7: Income Statement.....	23
Table 8: Operating Places' Info.....	24
Table 9: Direct cost Calculation (Transportation)	25
Table 10: Direct Cost Calculation (Depreciation)	26
Table 11: Direct Cost Calculation (Supplies).....	27
Table 12: Direct Cost Calculation (Salaries & Social security).....	28
Table 13: Operating Places' Info & Direct Costs	29
Table 14: Second Drive Cost Allocation Bases (Hicks 1999, 230)	29
Table 15: Identifying Costs of Activities.....	31
Table 16: Accumulating Costs % of Activities	32
Table 17: Identifying Activity Drivers & Accumulating Activities' Cost (Indirect Costs)	33
Table 18: Computing the rate per unit of activity cost.....	34
Table 19: Allocating Activities' cost to Cost objects	35
Table 20: Total Cost & EBIT of Ops.....	35
Table 21: Profitability Analysis	36
Table 22: Schedule #10 What If Analysis.....	37
Table 23: Adding and Eliminating OPs.....	38

List of figures

Figure 1: Stakeholders of the project (Own source)	Error! Bookmark not defined.
Figure 2: Indirect costs are displacing direct costs (Institute of Management Accountants 2006)	8
Figure 3: Expense Categories, Activities and Products relationship (Roztocki, Porter, Thomas & Needy 2004)	9
Figure 4: Cost assignment to a cost object (Horngren & al. 2012, 51).....	11
Figure 5: Variable & Fixed costs (Braun & Tietz 2013, 320,323)	12
Figure 6: Mixed Costs (Braun & Tietz 2013, 325).....	12
Figure 7: Expense Categories, Activities and Products relationship of The Company (Horngren & al. 2012).....	22
Figure 8: Schedule # 1.....	48
Figure 9: Schedule # 2.....	49
Figure 10: Schedule # 2.1.....	50
Figure 11: Schedule # 2.2.....	51
Figure 12: Schedule 2.3.....	52
Figure 13: Schedule 3.....	53
Figure 14: Schedule # 3.1.....	54
Figure 15: Schedule # 5.....	55
Figure 16: Schedule # 6.....	56
Figure 17: Schedule # 7.....	57
Figure 18: Schedule # 8.....	58
Figure 19: Schedule # 9.....	59
Figure 20: New OP cost calculation	60
Figure 21: Profitability analysis after eliminating and adding OPs	61

Reference

accountingtools. 2015a, Direct Labour. URL: <http://www,accountingtools,com/definition-direct-labour>. Accessed 4 March 2015.

accountingtools. 2015b, Indirect Labour. URL: <http://www.accountingtools.com/definition-indirect-labor>. Accessed 4 March 2015.

Arora, M. 2009. Cost and Management Accounting: Theory, Problems and Solutions, Himalaya Publishing House, Mumbai, IND. ProQuest ebrary. Accessed 27 May 2015.

Ashford C. Chea. 2011. Activity-Based Costing System in the Service Sector: A strategic Approach for Enhancing Managerial Decision Making and Competitiveness. School of Business, Kentucky Wesleyan College, 6, 2, pp. 3-10. URL: <http://www,ccsenet,org/journal/index,php/ijbm/article/view/11103/8985>. Accessed 27 April 2015.

Bahhub, BJ. 2010. Activity-Based Management for Financial Institutions: Driving Bottom-Line Results, John Wiley & Sons Inc. NJ, USA. ProQuest ebrary. Accessed 12 May 2015.

Braun, KW. & Tiez WM. 2013. Building Blocks of managerial Accounting, In: Managerial Accounting, 3rd ed. Pearson Publication. USA.

Drury, C. 2008. MANAGEMENT AND COST ACCOUNTING. 7th ed. Pat Bond. London.

Aamu- ja iltapäivätoiminta. 8a luku (19,12,2003/1136). URL: <http://finlex,fi/fi/laki/ajantasa/1998/19980628#L8a>. Accessed 5 May 2015.

Hicks, D, T. 1999. ACTIVITY BASED COSTING: Making it work for small and mid- sized companies, 2nd ed. USA: John Wiley & Sons, Inc.

Horngren, C., Datar, S. & Rajan, M. 2012. Cost Accounting: A managerial emphasis. 14th edition. Pearson Education Limited. England.

Horngren,C., Sundem,G. ,Burgstahler,D. & Schatzberg, J. 2014. Introduction to Management Accounting. 6th ed. Pearson Education Limited. England.

Institute of Management Accountants 2006. Implementing Activity-Based Costing. URL: <http://www.imanet.org/docs/default-source/research/sma/implementing-activity-based-costing.pdf?sfvrsn=2>. Accessed 2 March 2015.

Investopedia, LLC. 2015a. Activity-Based Costing – ABC. URL: <http://www.investopedia.com/terms/a/abc.asp>. Accessed: 4 March 2015.

Investopedia, LLC. 2015b. Earnings Before Interest & Tax – EBIT .URI: <http://www.investopedia.com/terms/e/ebit.asp>. Accessed 30 August 2015.

Investopedia, LLC. 2015c. Business Activities. URL: <http://www.investopedia.com/terms/b/business-activities.asp>. Accessed 11 May 2015.

Investopedia, LLC. 2015d. what-if-calculation. URL: <http://www.investopedia.com/terms/w/what-if-calculation.asp>. Accessed 4th Sep 2015.

Kaplan R, S. & Anderson S, R. 2007. TIME DERIVEN ACTIVITY BASED COSTING. Harvard Business School Publishing Corporation. USA.

Onat, OK., Anitsal, I. & Anitsal, M. 2014. Activity Based costing in services industry: A conceptual framework for entrepreneurs. *The Entrepreneurial Executive*, 19, pp.149-167. URI: <http://search.proquest.com/docview/1645742077?accountid=27436>.

Roztock, N. 2001. The Integrated Activity-Based Costing and Economic Value Added System for the Service Sector. *Proceedings of the International Conference on Service Management*, pp. 387 -379. Angers, France. URL: <http://www2.newpaltz.edu/~roztockn/angers01.htm>. Accessed 13 May 2015.

Roztock, N., Porter, J., Thomas, M. & Needy, K. 2004. A Procedure for Smooth Implementation of Activity-Based Costing in Small Companies. *Engineering Managerial Journal*, 16, 4, ProQuest Entrepreneurship. P 19. URL: http://www.researchgate.net/publication/228770907_A_procedure_for_smooth_implementation_of_activity-based_costing_in_small_companies. Accessed 4 May 2015.

WebFinance, Inc. 2015. Indirect material. URL: http://www.investorwords.com/16480/indirect_material.html. Accessed: 4 March 2015.

Appendix 1

Income Statement Year xxxx

Turnover	687,687
Club Income	266,104
Grands	421,582
Total Material Cost	6,728
Food Supplies	3,744
Craft Supplies	468
Office Supplies	2,516
Total Salaries & wages	497,751
Salaries	389,183
Wages	-
Social Security	108,568
Insurances	-
Total Expenses	47,711
<i>Depreciation</i>	2,280
<i>Transportation</i>	14,165
<i>Rent & Utilities</i>	12,642
Office Rent	12,279
Cleaning & Sanitation	363
Electricity & Gas	-
Building Insurance	-
G &A	18,623
Financial service cost	207
Marketing	1,623
R&D	602
Membership fees	1,302
Post costs	95
Taxi	52
Parking	
Phone Calls & Internet	10,770
Total Voluntary Personnel costs	3,972
Places Year Total Direct Costs	552,190

Appendix 2

Questionnaire

1. What type of a firm do you have?
2. What are the company's objectives and requirements from this project?
3. How many employees do you have?

	OP1	OP2	OP3	OP4	OP5	OP6	MO
Perma- nent fixed salaries							
Part- time							
Substi- tute							

4. How many students do you have?

	OP1	OP2	OP3	OP4	OP5	OP6
Normal						
Special						

5. Who are the customers?
6. Is there any special services provided for different types of student?
7. What are the services provided by the company?
8. What are activities performed in the business (define activities)?
9. How does the current system work?
10. How is depreciation cost measured?
11. How do you allocate costs to your operational branches?
12. What are the legal issues regarding to pricing and expenses in this business?
13. How does the current costing system work?

Appendix 3

User Manual

You must remember to fill in areas in the boxes only. The other areas are locked and not changeable by the user. The green cells shows that, the income statements' expense is fully allocated, and the result of the total of calculation is equal to the expense category. Each schedule except # 1 has extra lines for future use and three more lines for different scenarios. However different scenarios calculation schedules are not created which requires to be created in future if they are needed.

Schedules' list

Schedule Lists

Location	Number	Title
H1	Schedule#1	Income Statement
A50	Schedule# 2	Direct Cost Calculation
H50	Schedule# 2.1	Direct Cost Calculation
A84	Schedule# 2.2	Direct Cost Calculation
H84	Schedule# 2.3	Direct Cost Calculation
A121	Schedule# 3	Operating Places' Info & Direct Costs
H121	Schedule# 3.1	Operating Places' Info & Direct Costs
A151	Schedule# 4	Activities
H151	Schedule# 4.1	Activities
A175	Schedule# 5	Accumulating Costs % of Activities
H175	Schedule# 6	Identifying Activity Drivers & Accumulating Activities' Cost (Indirect Costs)
A215	Schedule# 7	Allocating Activities' cost to Cost objects
H215	Schedule# 8	Total Cost & EBIT of Ops
A234	Schedule# 9	Profitability analysis
H 234	Schedule# 10	What if analysis

Step 1: Income Statement

You should fill in Schedule # 1, Income statement as the figures will be used in the calculations of other schedules. When you filled in the required numbers which can be obtained from income statement, you can see the % of total material cost, total salaries, total expenses and total costs from the total turnover.

Income Statement	Year XXXX	Schedule#1
<i>Company X</i>	€	%
Turnover	687 686	
Club Income	266 104	
Grands	421 582	
Total Material Cost	6 728	1 %
<i>Total Equipments</i>	-	
Computers & Software		
Snack Dinning		
Furnitures		
Mobile Phones		
Car		
Toys, Books, Magazines		
Office Equipment		
<i>Supplies</i>	6 728	
Food Supplies	3 744	
Craft Supplies	468	
Office Supplies	2 516	
Total Salaries & wages	497 750	72 %
Salaries	160 000	
Wages	229 182	
Social Securities	108 568	
Insurances		
Total Expenses	47 710	7 %
<i>Depreciation</i>	2 280	
<i>Transportation</i>	14 165	
<i>Rent & Utilities</i>	12 642	
Office Rent	12 279	
Cleaning & Sanitation	363	
Electricity & Gas	-	
Building Insurance	-	
Phone Calls & Internet	10 770	
<i>G & A</i>	7 853	
Financial service cost	207	
Marketing	1 623	
R&D	602	
Membership fees	1 302	
Post costs	95	
Taxi	52	
Parking	-	
Total Voluntary		
Personnel costs	3 972	
Entertainments and leisure	164	
Gift for personnel	-	
Voluntary		
Personnel costs	3 808	
Total Costs	552 188	

Figure 6: Schedule # 1

Step 2: Direct Cost calculation

If you already have information related to direct costs, travelled distance, working hours and number of deliveries skip this step otherwise fill in the boxes in schedules # 2, 2.1, 2.2 and 2.3 to calculate transportation, depreciation, supplies and salaries related to cost objects.

In schedule # 2 you should insert the transportation € amount whether from the income statement or other sources if available. Then you should insert year beginning and end Kilometers travelled to get the total year distance travelled in the year. Next you must insert the distance of each place from the main office and the number of deliveries in a year to each place. At the bottom you will see the total amounts used and spend on operating places and the main office.

Direct Cost Calculation		Schedule# 2		
Company X				
Transportation				
Transportation € (Mileage from Income statement)			14 165	€
Year beginning Km			120 000	Km
Year End Km			121 500	Km
Total Year Km			1 500	Km
€/Km			9,44	€
	Distance Km From Main Office	No. Of Deliveries	Total Distance Km	Total Cost €
OP #1	10	12	120	1 133
OP #2	9	6	54	510
OP #3	8	12	96	907
OP #4	7	6	42	397
OP #5	6	12	72	680
OP #6	5	6	30	283
Future Use			-	-
Future Use			-	-
Future Use			-	-
Future Use			-	-
Future Use			-	-
Future Use			-	-
Future Use			-	-
Future Use			-	-
Future Use			-	-
Future Use			-	-
Future Use			-	-
Future Use			-	-
Future Use			-	-
Total	45	54	414	3 910
Main Office			1 086	10 255
Total Transportation				14 165

Figure 7: Schedule # 2

In schedule # 2.1 you should insert the total planned depreciation from income statement and the total equipment or any other available depreciation amount. Then estimate the total value of equipment of the operating places. The result will be total assets' percentages, total assets of OPs and total assets of the main office.

Direct Cost Calculation		Schedule# 2.1	
Company X			
Depreciation			
Total Depreciation € (Planned Depreciation from Income statement)		2 280	
Total Assets €		10000	
	Assets Value €	% of Total Assets	Depreciation €
OP #1	1 839	18 %	419
OP #2	920	9 %	210
OP #3	2 513	25 %	573
OP #4	460	5 %	105
OP #5	1 808	18 %	412
OP #6	460	5 %	105
Future Use		0 %	-
Future Use		0 %	-
Future Use		0 %	-
Future Use		0 %	-
Future Use		0 %	-
Future Use		0 %	-
Future Use		0 %	-
Future Use		0 %	-
Future Use		0 %	-
Future Use		0 %	-
Total	8 000	80 %	1 824
Main Office	2 000	20 %	456
Total Depreciation			2 280

Figure 8: Schedule # 2.1

In Schedule # 2.3 insert the actual or estimated average hourly salary then you will see the social security's percentage out of the salaries paid as well as the total and social security paid to each place.

Direct Cost Calculation		Schedule# 2.3		
Company X		Salaries & Social Securities		
Average Hourly Salary €				17
Social Securities (% from Salaries Paid)				28 %
	Total Hours Worked	Total Salaries €	Total Social Security €	Total Salaries & Social security
OP #1	3 600	60 480	16 872	77 352
OP #2	2 000	33 600	9 373	42 973
OP #3	5 467	91 846	25 622	117 467
OP #4	1 000	16 800	4 687	21 487
OP #5	3 933	66 074	18 432	84 507
OP #6	1 000	16 800	4 687	21 487
Future Use		-	-	-
Future Use		-	-	-
Future Use		-	-	-
Future Use		-	-	-
Future Use		-	-	-
Future Use		-	-	-
Future Use		-	-	-
Future Use		-	-	-
Future Use		-	-	-
Total	17 000	285 600	79 672	365 272
Main Office €		103 582	28 896	132 478
Total Salaries		389 182	108 568	497 750

Figure 10: Schedule 2.3

Step 3: Operating places' info and direct costs

In this step you are required to insert information for calculating indirect costs of operating places in schedules # 3 and 3.1. You can whether use the results of calculations in previous step or use real data if they are available.

In schedule 3 you should insert names of the operating places, Salaries & wages, Social security, Supplies, Transportation, Depreciation and calls & internet for each cost object. As a result you will get the total direct costs of cost objects and total expense resources.

Operating Places' Info & Direct Costs							Schedule# 3
Company X							
	Salaries & Wages €	Social Securities €	Supplies €	Transportation €	Depreciation €	Calls & Internet €	Total Direct Cost €
OP #1	60 480	16 872	1 341	1 133	419	1 539	81 783
OP #2	33 600	9 373	670	510	210	1 539	45 902
OP #3	91 846	25 622	1 836	907	573	1 539	122 321
OP #4	16 800	4 687	335	397	105	1 539	23 862
OP #5	66 074	18 432	1 333	680	412	1 539	88 471
OP #6	16 800	4 687	335	283	105	1 539	23 748
Future Use							-
Future Use							-
Future Use							-
Future Use							-
Future Use							-
Future Use							-
Future Use							-
Future Use							-
Future Use							-
Future Use							-
Total	285 600	79 672	5 850	3 910	1 824	9 231	386 088

Figure 11: Schedule 3

You should add No. of Children, No. of Employees, No. of Invoices, No. of Payrolls, No. of Deliveries for each operating place in Schedule #3.1. You will see at the bottom of the schedule the summation of each required information category.

Operating Places' Info & Direct Costs							Schedule# 3.1
Company X							
	No. Of Children	No. of Employees	Direct Working Hours	No. of Invoices	No. of Payrolls	No. of Deliveries	Total Distance km
OP #1	60	4	3 600	240	36	12	120
OP #2	30	2	2 000	120	18	6	54
OP #3	82	6	5 467	328	54	12	96
OP #4	15	1	1 000	60	9	6	42
OP #5	59	6	3 933	236	54	12	72
OP #6	15	1	1 000	60	9	6	30
Future Use							
Future Use							
Future Use							
Future Use							
Future Use							
Future Use							
Future Use							
Future Use							
Future Use							
Future Use							
Future Use							
Future Use							
	261	20	17 000	1 044	180	54	414

Figure 12: Schedule # 3.1

You will probably see schedules # 4 and 4.1 which are related to gathering hours spend on each activity. Though these schedules are not required to be fill as they are not going to be used in the calculations in this tool. These two schedules are created for the future use if the company wants to improve the tool and take it from a simple ABC to a multiple stages ABC. So they are not going to be explained now.

Schedule # 6 is to accumulate costs for activities based on the given percentages in Schedule # 5. This schedule needs you to insert indirect costs. Indirect costs are total salaries & wages, total materials & supplies and total expenses of the main office. This costs are currently available in previous schedules if you do not have them available otherwise you can use cost other than those calculated. When you feed the costs into the schedule, you will see the costs of each activity pool. Using the monthly based salary in the previous example, you will see that cost of salary for accounting is 31,075 €, for Procurement is 15,537 €, for HR is 41,433 €, for Transportation is 0 € and for G&A is 19,872 €. As it is shown in this schedule there are three categories of costs, Total salaries & wages, Total Materials & Supplies and Total Depreciation. These categories are calculated automatically by summing up the sub cost categories under them.

At the bottom of this schedule under the Total activity cost you will see the Activities' costs drivers and rate per unit of Cost drivers' calculation mechanism. This part is calculated automatically. For example you see that the Activity cost driver for accounting is Number of payrolls and Invoices, the total cost dividers are 1224 (in schedule # 3.1) and the rate per Unit of the Cost driver is 35 €.

Identifying Activity Drivers & Accumulating Activities' Cost (Indirect Costs)							Schedule# 6
Company X							
	Cost €	Accounting	Procurement	HR	Transportation	G&A	
Total Salaries & Wages	132,478	39,743	19,872	52,991	-	19,872	
Monthly based Salary	103,582	31,075	15,537	41,433	-	15,537	
Hourly based Wages	-	-	-	-	-	-	
Social Securities	28,896	8,669	4,334	11,558	-	4,334	
Total Materials & Supplies	878	176	50	101	-	551	
Food	374	-	-	-	-	374	
Office	503	176	50	101	-	176	
Total Expenses	32,745	2,620	46	2,711	10,347	17,022	
Depreciation	456	91	46	182	91	46	
Rent & utilities	12,642	2,528	-	2,528	-	7,585	
Transportation	10,255	-	-	-	10,255	-	
G&A	9,392	-	-	-	-	9,392	
Phone Calls & Internet	1,539	-	-	-	-	-	
Total Activity Cost	166,100	42,539	19,968	55,803	10,347	37,445	
Activities' Cost Drivers		Number of Payrols & Invoices	Number of Deliveries	% of Total paid salaries & Wages	Total Distace Km	% of Internal Costs	
Total Cost drivers		1,224	54	365,272	414	128,656	
Rate per Unit of Cost Driver		35	370	15%	25	29%	

Figure 14: Schedule # 6

Step 5: Allocating activities' cost to cost objects

Schedule # 7 is for calculating the costs of activity pools to cost objects. In this schedule the rates acquired in schedule # 6 is multiplied by the driver costs used from schedule # 3.1. For instance in Accounting activity the rate of 35 € is multiplied by the total of No. of invoices 240 + No. of payrolls 36 = 9,592 € for OP #1. In the last column the total place Cost € represent the summation of all activity costs of each place which in our example is 37,241 € for OP #1.

At the bottom of this schedule the summation of total Activity cost is divided among cost objects. This is provided to ensure that the whole amount of activity pool is allocated to cost objects. Pay attention if you see " Error" in total activity it shows that there is a problem in calculation and the total summation of activities are not equal to the whole cost of activity calculated in schedule # 6. The problem can be basically in Schedule # 5 as you may have forgotten to insert a percentage of usage for one of the expense resources.

Allocating Activities' cost to Cost objects						Schedule# 7
Company X						
	Accounting	Procurement	HR	Transportation	G&A	Total Place Cost €
Rates	35	370	15%	25	29%	
OP #1	9,592	4,437	11,817	2,999	8,395.28	37,241
OP #2	4,796	2,219	6,565	1,350	4,345.07	19,274
OP #3	13,276	4,437	17,945	2,399	11,076.54	49,134
OP #4	2,398	2,219	3,282	1,050	2,604.50	11,553
OP #5	10,079	4,437	12,910	1,799	8,505.88	37,731
OP #6	2,398	2,219	3,282	750	2,517.21	11,166
Future Use	-	-	-	-	-	-
Future Use	-	-	-	-	-	-
Future Use	-	-	-	-	-	-
Future Use	-	-	-	-	-	-
Future Use	-	-	-	-	-	-
Future Use	-	-	-	-	-	-
Future Use	-	-	-	-	-	-
Future Use	-	-	-	-	-	-
Future Use	-	-	-	-	-	-
Future Use	-	-	-	-	-	-
Future Use	-	-	-	-	-	-
Senario # 1	-	-	-	-	-	-
Senario # 2	-	-	-	-	-	-
Senario # 3	-	-	-	-	-	-
Total Activity	42,539	19,968	55,802	10,347	37,444	166,100

Figure 15: Schedule # 7

Step 6: Total cost and Earnings Before Interest and Tax

In Schedule # 8 you insert the club income and grands to each operating place and you will see the Earnings Before Interest & Taxes. Direct Cost and Indirect cost are used from schedule #3 and # 8 and total cost is their summation results.

Total Cost & EBIT of OPs			Schedule# 8			
Company X						
	Club Income	Grands	Direct Cost	Indirect Cost	Total Cost	Earning Before Interest & Tax
OP #1	61,173	96,915	81,783	37,241	119,024	39,064
OP #2	30,587	48,458	45,902	19,274	65,176	13,869
OP #3	83,604	132,451	122,321	49,134	171,456	44,599
OP #4	15,293	24,229	23,862	11,553	35,415	4,107
OP #5	60,154	95,300	88,471	37,731	126,202	29,252
OP #6	15,293	24,229	23,748	11,166	34,915	4,607
Future Use			-	-	-	-
Future Use			-	-	-	-
Future Use			-	-	-	-
Future Use			-	-	-	-
Future Use			-	-	-	-
Future Use			-	-	-	-
Future Use			-	-	-	-
Future Use			-	-	-	-
Future Use			-	-	-	-
Future Use			-	-	-	-
Scenario # 1			-	-	-	-
Scenario # 2			-	-	-	-
Scenario # 3			-	-	-	-
Total	266,104	421,582	386,088	166,100	552,188	135,498

Figure 16: Schedule # 8

Step 7: Profitability Analysis

Schedule # 9 is created to give you an understanding of the profitability of places by providing certain types of percentages which are revenue % from the total revenue, cost % from the total revenue and Earnings % from the total revenue. By using this figures you will be able to understand that how many percent of cost is spent on how many percent of children as well as how many percent of earnings is gained from how many percent of children.

	Profitability Analysis			Schedule# 9		
	Total Revenue	Total Cost	Earning Before Interest & Tax	Revenue % from total revenue	Cost % From Total Revenue	Earnings % from total Revenue
OP #1	158 088	119 024	39 064	23 %	75 %	25 %
OP #2	79 045	65 176	13 869	11 %	82 %	18 %
OP #3	216 055	171 456	44 599	31 %	79 %	21 %
OP #4	39 522	35 415	4 107	6 %	90 %	10 %
OP #5	155 454	126 202	29 252	23 %	81 %	19 %
OP #6	39 522	34 915	4 607	6 %	88 %	12 %
Future Use	-	-	-	0 %	0 %	0 %
Future Use	-	-	-	0 %	0 %	0 %
Future Use	-	-	-	0 %	0 %	0 %
Future Use	-	-	-	0 %	0 %	0 %
Future Use	-	-	-	0 %	0 %	0 %
Future Use	-	-	-	0 %	0 %	0 %
Future Use	-	-	-	0 %	0 %	0 %
Future Use	-	-	-	0 %	0 %	0 %
Future Use	-	-	-	0 %	0 %	0 %
Future Use	-	-	-	0 %	0 %	0 %
Total	687 686	552 188	135 498	100 %	80 %	20 %

Figure 17: Schedule # 9

Schedule # 10 is designed to calculate what if analysis. This types of analysis are used to stimulate the profitability and costs under different circumstances. By using this schedule you can see what will happen if you eliminate or add places to the list. This schedule has two part. Part one is used to calculate the direct and indirect cost of a new place that the company intends to make contract for and the second part is to see whether if there would be a change in the total cost and profitability level of the company by eliminating and adding operating places.

The first part is illustrated in figure 20. As you can see in this part you should insert figures related to club income, grands and all of the direct costs required to this part of the schedule. After inserting numbers you will see the calculated indirect cost based on the rates calculated before as well as the total cost and Earnings Before interest and tax (EBIT).

What If Analysis

Schedule# 10

Scenario 1 Adding and eliminating OP

	216055			
Revenue	216055			
Club Income	83604			
Grands	132451			
	Direct Cost	Rates	Indirect Cost	Total Cost
Salaries & Wages €	91,486		17,889.63	134,991.71
Social Securities €	25,616	15%		
Supplies €	5,850			5,850.00
Transportation €	907			907.00
Depreciation €	573			573.00
Calls & Internet €	1,539			1,539.00
No. Of Children	82			
No. of Employees	4			
Direct Working Hours	5,467			
No. of Invoices	240	35	10,009.17	10,009.17
No. of Payrolls	48			
No. of Deliveries	12	370	4,437.23	4,437.23
Total Distance km	120	25	2,999.03	2,999.03
G&A		29%	10,284.06	10,284.06
Total cost	125,971		45,619.13	171,590.21
EBIT				44,464.79

Figure 18: New OP cost calculation

In the second part illustrated in Figure 21, you are required to insert the Operating place's info that you are willing to drop. As you can see in this part the result of dropping one place (for this case OP # 6) is shown. For example there is no change in the total costs and EBIT by eliminating OP# 6 in relation to the total revenue but in difference line it shows that adding the new place will increase the direct cost from 386,088 € to 488,310€ which later one is 27% more than the former and the difference is 102,223 €. The result also shows increase in indirect cost by 28% and EBIT by 30 %.

	Total Revenue	Direct Cost	Indirect Cost	Earning Before Interest & Tax	Revenue % from total revenue	Direct Cost % from total Revenue	Indirect % fom total revenue	Earning % from total Revenue
Total Ops	687,686	386,088	166,100	135,498	100%	56%	24%	20%
Eliminate OP # 6	39,522	23,748	11,166	4,607	6%	60%	28%	12%
<hr/>								
Total Without eliminated Op	648,164	362,339	154,934	130,891	75%	56%	24%	20%
Add new OP	216,055	125,971	45,619.13	44,465	25%	58%	21%	21%
Total	864,219	488,310	200,553	175,356	100%	57%	23%	20%
Diference	176,533	102,223	34,453	39,857	27%	28%	22%	30%

Figure 19: Profitability analysis after eliminating and adding OPs