

A Work Project, presented as part of the requirements for the Award of a Master Degree in Management from the NOVA – School of Business and Economics.

Product Costing and Activity-Based Costing/Management in Bacalhôa Vinhos de Portugal

APPENDIX

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A Project carried out on the Master in Management Program, under the supervision of:

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Appendix 1

Robert K. Yin's framework for "Relevant Situations for Different Research Methods".

<i>METHOD</i>	<i>Form of Research Question</i>	<i>Requires Control of Behavioral Events?</i>	<i>Focuses on Contemporary Events?</i>
<i>Experiment</i>	How, why?	Yes	Yes
<i>Survey</i>	Who, what, where, how many, how much?	No	Yes
<i>Archival Analysis</i>	Who, what, where, how many, how much?	No	Yes/No
<i>History</i>	How, why?	No	No
<i>Case Study</i>	How, why?	No	Yes

Source: Yin, R.K., 2009. Case Study Research: Design and Methods (Applied Social Research Methods). Thousand Oaks, CA, Sage Publications, Inc.

Appendix 2

List of conducted interviews.

Date	Interviewees	Subject	Taped
02.02.2016	Finance director	Presentation of the WP goals; discussion of possible themes.	No
16.03.2016	Finance director; Enology director; Viticulture director; Viticulture assistant	Description of the process and operations in the viticulture area; introduction of Agro ABC; description of the costing system; delivery of some registration sheets' of two different vineyards.	Yes
22.03.2016	Viticulture director; Viticulture assistant	Enlightening of questions regarding specific activities in viticulture; description of activities; delivery of a Field Worksheet from a vineyard in investment.	Yes
06.04.2016 (all day visit)	Finance director	Description of actual costing method; motivations for implementing ABC system; overhead costs allocation method; ABC mechanics; difficulties faced in the process; individuals involved in the process; explanation of why a Pilot implementation; management uses of the ABC data.	Yes
21.04.2016	Enology director	Description of the winemaking process; description of the bottling process; ABC implementation scenario.	Yes
	Operations assistant	ABC implementation scenario.	Yes
	Viticulture assistant	ABC implementation process feedback (difficulties).	Yes
02.05.2016 (all day visit)	Finance director	Details in the overhead computation; description of Fair Value computation; general doubts.	Yes

Appendix 3

Interviews' scripts.

2nd Visit Interview Script

Viticulture director

I am doing my master thesis in Bacalhôa in order to study the implementation process of the Activity-Based Costing system in the Viticulture area. Given this, I first would like to know how the Viticulture process is and how the costing system works.

- How is the process of grape production?
 - What are the operations performed each year?
 - What are the main resources necessary for each activity?
 - The costing system adopted is the Activity-Based Costing.
 - How does it works in Bacalhôa?
 - How is the data collection done?
 - Who is involved in the process?
 - When did the implementation process start and how long did it took?
 - How was the process? Did you find any difficulties?
-

Finance director

In this meeting, I would like to make you some questions regarding the actual costing system.

- I would like to know if there is a calculation of the wine cost and how is it computed?
- How is the link between the Activity-Based Costing in Viticulture and the cost center method in the other areas?
- Regarding the Activity-Based Costing.
 - How does it works in Bacalhôa?
 - How is the data collection done?
 - Who is involved in the process?
 - When did the implementation process start and how long did it took?
 - How was the process? Did you find any difficulties?

3rd Visit Interview Script

Viticulture director and Viticulture assistant

After our last meeting, I was able to gather all the activities performed in the Viticulture area. Given this, I am developing a Dictionaries of Activities, in which a brief description of each activity is given. Thus, I will ask your help in defining several activities.

- Soil mobilizations; Maintenance; Herbicides; Binding vineyards; *Descava*; *Desfolhar*; *Despampanar*; Fertilize; Harvest; Irrigation; Phytosanitary treatments; Plantation; Pruning; *Raspa*; *Retancha*; *Ripagem*; Soil correction; Trellising.

- What are the differences between Pruning, Pre-Pruning, Winter Pruning and Green Pruning?
- What is the activity ‘Others’ that appears in the Field Worksheet?
- The transportation activity comprises all the transports necessary or only the transportation of the grapes to the winery?
- What are the differences, in terms of activities, between the vineyards in exploitation and in investment?

4th Visit Interview Script

Finance Director

Today I would like to understand the motivations behind the adoption of the Activity-Based Costing in the Viticulture area.

Given this, the main goal of this interview is to understand how the cost of production of a bottle of wine is computed (Part 1), as well as how was the implementation process of the ABC system (Part 2).

Part 1

- How do you calculate the cost of production of a certain bottle of wine?
- How are overhead costs allocated to the wine (electricity, water, labor, facilities)?

Part 2

- In the viticulture area, the system adopted is the ABC as already mentioned in a previous interview. I would like to know when it was implemented and what were the reasons and motivations behind the change in costing system?
- How went the implementation process? Who was involved in the design and implementation of the new system?
- Did you find any obstacles or difficulties during the implementation process?
- Why did the company decided to adopt the ABC system only in the Viticulture area? There are plans of expansion to the other areas of the company?
- How does the system work? With the data collected from the Field Worksheet how it is reached the cost of the grapes?
- Regarding the information coming from the ABC system, which management analysis are done, besides the costing purposes?

5th Visit Interview Script

Enology Director

I am doing my master thesis here in Bacalhôa Vinhos de Portugal, through a Case Study regarding the implementation process of a costing system. I would like to make a few questions, first to understand the winemaking process (Part 1) and then to know which are the most prestigious wines (Part 2). Last, I will present you a small scenario in order to know your opinion (Part 3).

Part 1

- How is the winemaking process? (understand the limits between winemaking and bottling)
- Who is in charge for the bottling process? (Enology or Operations department)
- There are operations that are performed during the bottling process (filtration, *colagem*, aging), which department is in charge of managing them?

Part 2

- What are the wines that bring more success to the company?
- What are the awards that have more meaning to the “wine world”?

Part 3

The actual costing system that Bacalhôa uses to cost its products is the traditional one, where there are several cost centers aggregating the indirect costs, that will later be allocated to each department through a previously defined rate.

Imagine that the company decides to adopt a new costing system: the Activity-Based Costing (ABC). This system focus in using activities to an easier and more accurate costing of the products. It is based in understanding that products consume activities and not resources. Besides this, the ABC system allows the company to do operational and strategic analysis, such as the elimination of non-value added activities, improvements to activities with high resource demands, which products are the most profitable ones.

With the change in the costing system, what would change in your department would be the organization per activities and the record keeping of some data. During the implementation process, a data gathering process would be necessary to collect the time and resources spent per activity. In your daily life, it would be necessary to keep record of several drivers of the activities, such as the setups time, kilos, transactions, hours spent per products.

Example:

<i>Activities</i>	<i>Cost Driver</i>
Crushing	Machine Hour
Transportation to fermentation	Kgs/Liters
Filtration	Liters

- Taking into consideration this scenario, and the benefits that it would bring to the company, do you consider that it would be feasible? (focus in the department of the interview)
- Why? Why not?
- What are the difficulties that, in your opinion, would appear?
Focus in: Resistance; Work load; Power shift

Viticulture Assistant

Today I would like to make you a few questions regarding the implementation process that occurred in 2008, when ABC was adopted as a costing system.

- How do you describe the implementation process?
- Your position within the group suffered some changes, as you became in charge of the data centralization process. How did you faced that change?

- Did you find any difficulties during the process?
- Since you are the one in charge of doing the bridge between the group “facilities” personnel and the field personnel, did you heard some complaints during the process?

Operations Assistant

I am doing my master thesis here in Bacalhôa Vinhos de Portugal, through a Case Study regarding the implementation process of a costing system. I would like to make a few questions, first to understand the bottling process (Part 1) and then to present you a small scenario in order to know your opinion (Part 2).

Part 1

- How is the bottling process? (understand the limits between winemaking and bottling)
- Who is in charge for the bottling process? (Enology or Operations department)
- There are operations that are performed during the bottling process (filtration, *colagem*, aging), which department is in charge of managing them?

Part 2

The actual costing system that Bacalhôa uses to cost its products is the traditional one, where there are several cost centers aggregating the indirect costs, that will later be allocated to each department through a previously defined rate.

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With the change in the costing system, what would change in your department would be the organization per activities and the record keeping of some data. During the implementation process, a data gathering process would be necessary to collect the time and resources spent per activity. In your daily life, it would be necessary to keep record of several drivers of the activities, such as the setups time, kilos, transactions, hours spent per products.

Example:

<i>Activities</i>	<i>Cost Driver</i>
Add cork stopper	Machine Hour
Transportation of bottles	Kgs

- Taking into consideration this scenario, and the benefits that it would bring to the company, do you consider that it would be feasible? (focus in the department of the interview)
- Why? Why not?
- What are the difficulties that, in your opinion, would appear?

Focus in: Resistance; Work load; Power shift

6th Visit Interview Script

Finance Director

- In Agro ABC, how do you reach the cost rates for labor and machine hours? What are the costs used for each cost rate?
- The direct materials that are bought by Agro ABC, where do they enter in the vineyards cost?
- What is the proportion between in house produced grapes vs grapes that are bought?
- When did you start planning the creation of Agro ABC? Did ABC/M appeared from the beginning or as a consequence of the creation?
- Due to illiteracy, the Field Worksheet is a pocket handbook which employees have to carry. Who is responsible for the “computation” process of those records?
- The costing of the wine is done every year for each wine? Or for each product category?
- What is the motivation behind knowing the cost of production of a bottle of wine?
- Looking to the costing system that you previously explained, how do you compute the overheads? How do you differentiate the overheads through each brand of wine?

Appendix 4

Structure of the group.



Source: Company information in interviews with Finance director.

Appendix 5

Activities performed in the Viticulture stage of the wine making process.

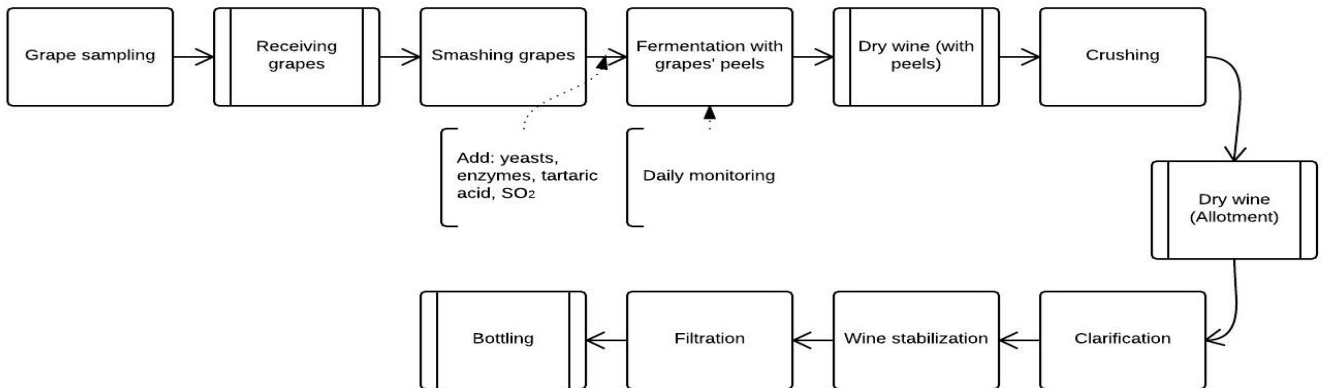
Activities	Description	Resources
Administration of Herbicides (<i>Monda Química</i> ¹)	Administration of chemicals aiming to control the growth of weeds that can be harmful to the vineyards.	Tractors; Labor
Binding vineyards	Consists in binding the vineyards. It is more frequent in vineyards that are in investment. In vineyards that are already in exploitation it is only incurred to maintenance purposes.	Labor
<i>Descava</i> ¹	To dig around the vine to cut the superficial roots, avoiding the emergence of roots, protecting from erosion and seizing the rain water.	Labor
<i>Desfolhar</i> ¹	To prune young branches and useless leaves, to facilitate the grape growth.	Tractors
<i>Despampanar</i> ¹	Removing the shoots of the vine, meaning, to remove the branches with leaves.	Tractors
Fertilize	Soil fertilization through the application of organic fertilizers (nitrogen, phosphorus and potassium), or manures to reduce the lack of nutrients.	Labor; Tractors
Grapes transport	Transporting the grapes picked to the winery.	Labor; Trucks
Harvest	Process of collecting the grapes that have already reach the intended level of ripeness.	Machinery; Labor
Irrigation	To provide water to the vineyards, according to its necessity.	Labor
Maintenance and Preservation	It includes opening ditches in the vineyards already in exploitation to allow the passage of pipes, and (in its majority) to fix streets to facilitate the passage of the trucks and machinery.	Labor; Backhoe; Spinning; Uniloader
Others	It gathers several operations that are necessary to the vineyards but not with a high level of frequency: cleanings, fix tubes, among others.	-
Phytosanitary treatments	To apply treatments intended to avoid the propagation of plagues and diseases (includes herbicides, pesticides and insecticides).	Tractors
Plantation	Consists in planting the vineyards in to the soil.	Tractors
Pruning	To remove part of the branches and leaves that are unnecessary, allowing a regular production and growth of the branches with grapes.	Pruning shears; Labor
Pre-Pruning	Initial prune which aims to facilitate the following prunes.	Tractors
Winter Pruning	Pruning with the objective of controlling the production of the vine.	Labor
Green (Summer) Pruning	Pruning the leaves cloaking the branches.	Labor
<i>Raspa</i> ¹	To remove weeds from the basis of the vine.	Labor; Hoe
<i>Retanchar</i> ¹	Replantation or substitution of a vine.	Labor
<i>Ripagem</i> ¹	Land preparation, in a linear shape, leaving a vertical ditch with 50 to 70 cm of depth.	Tractors
Soil correction	To add the nutrients that are missing when analyzing the soil.	Tractors
Soil mobilizations	Consists in preparing the soil for the plantation phase.	Tractors
Trellising	Putting posts and wiring the vineyards.	Labor

Source: Company information in interviews with Viticulture department.

¹ Activities' names were kept in Portuguese due to the difficulty in the translation of Agricultural terminology.

Appendix 6

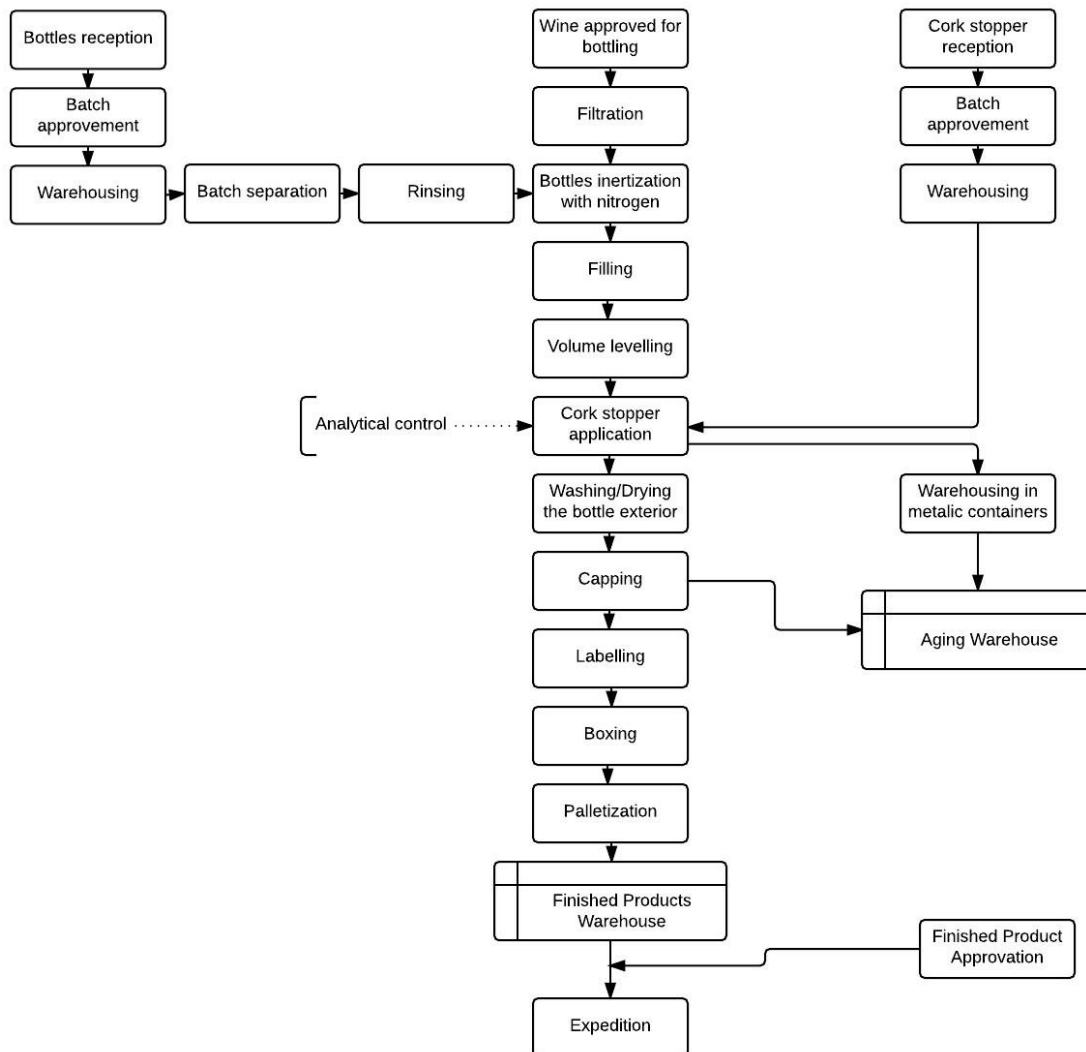
Flowchart of the Enology stage of the Red Wine wine making process.



Source: Company document from the Enology department.

Appendix 7

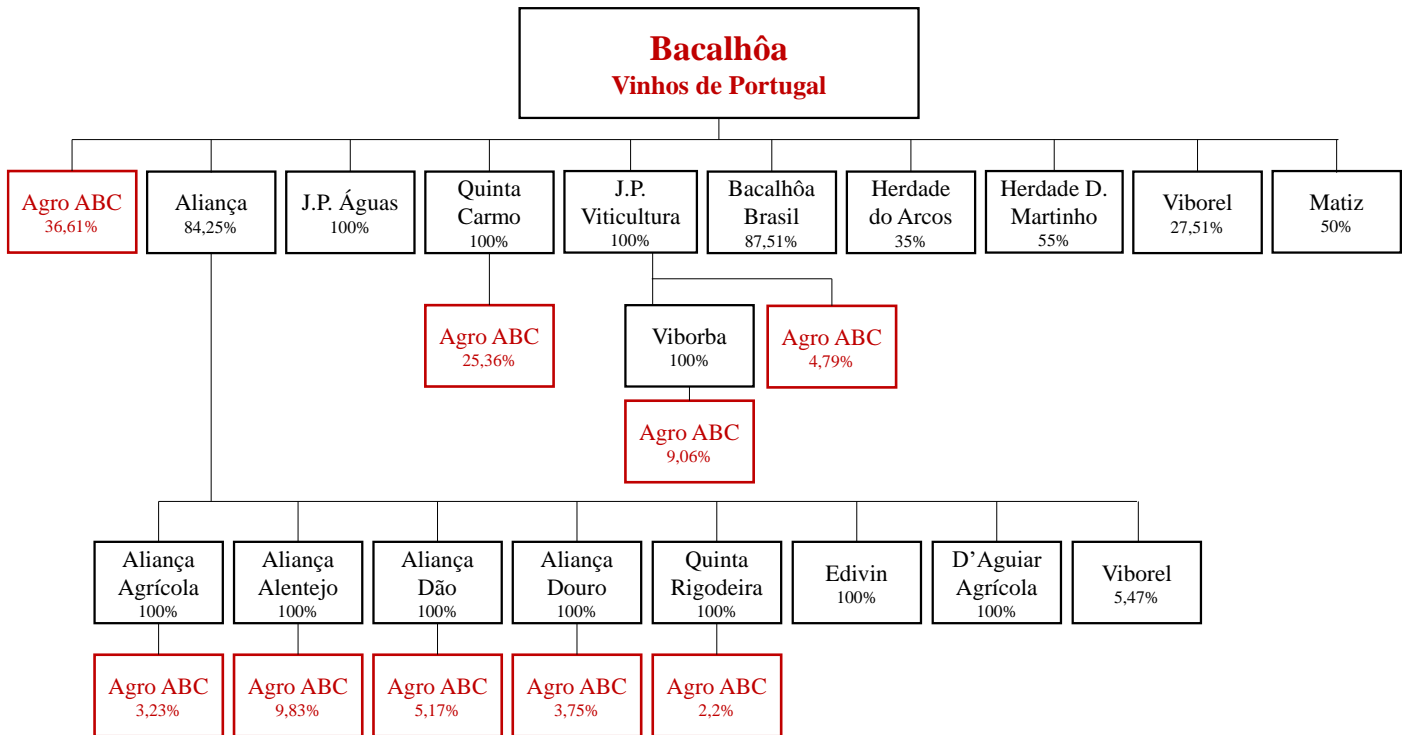
Flowchart of the **standard** Operations stage of the wine making process.



Source: Company document from the Operations department.

Appendix 8

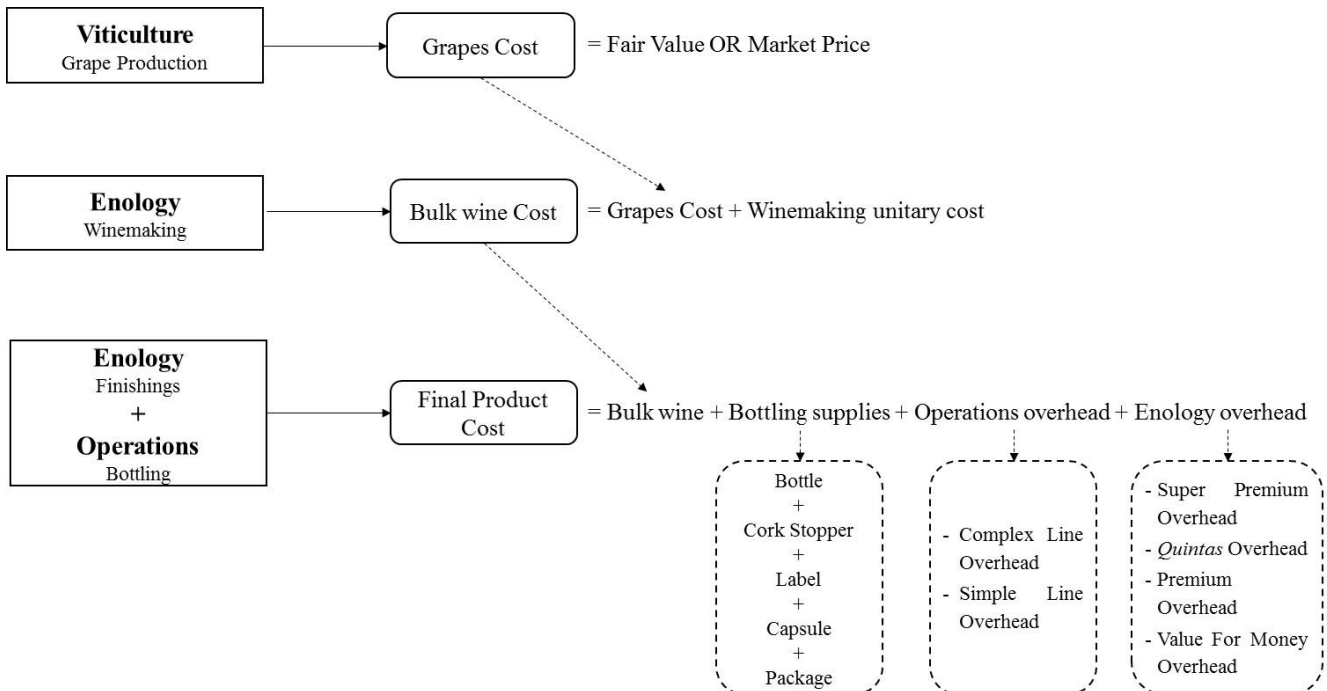
Position of the group in the several enterprises which it is formed by.



Source: Company document delivered in an interview with the Finance director.

Appendix 9

Wine costing diagram.



Source: Own elaboration with company information in interviews with the Finance director.

Appendix 10

Description of the calculation of the Fair Value of the Grapes.

Calculation of the Fair Value of the Grapes

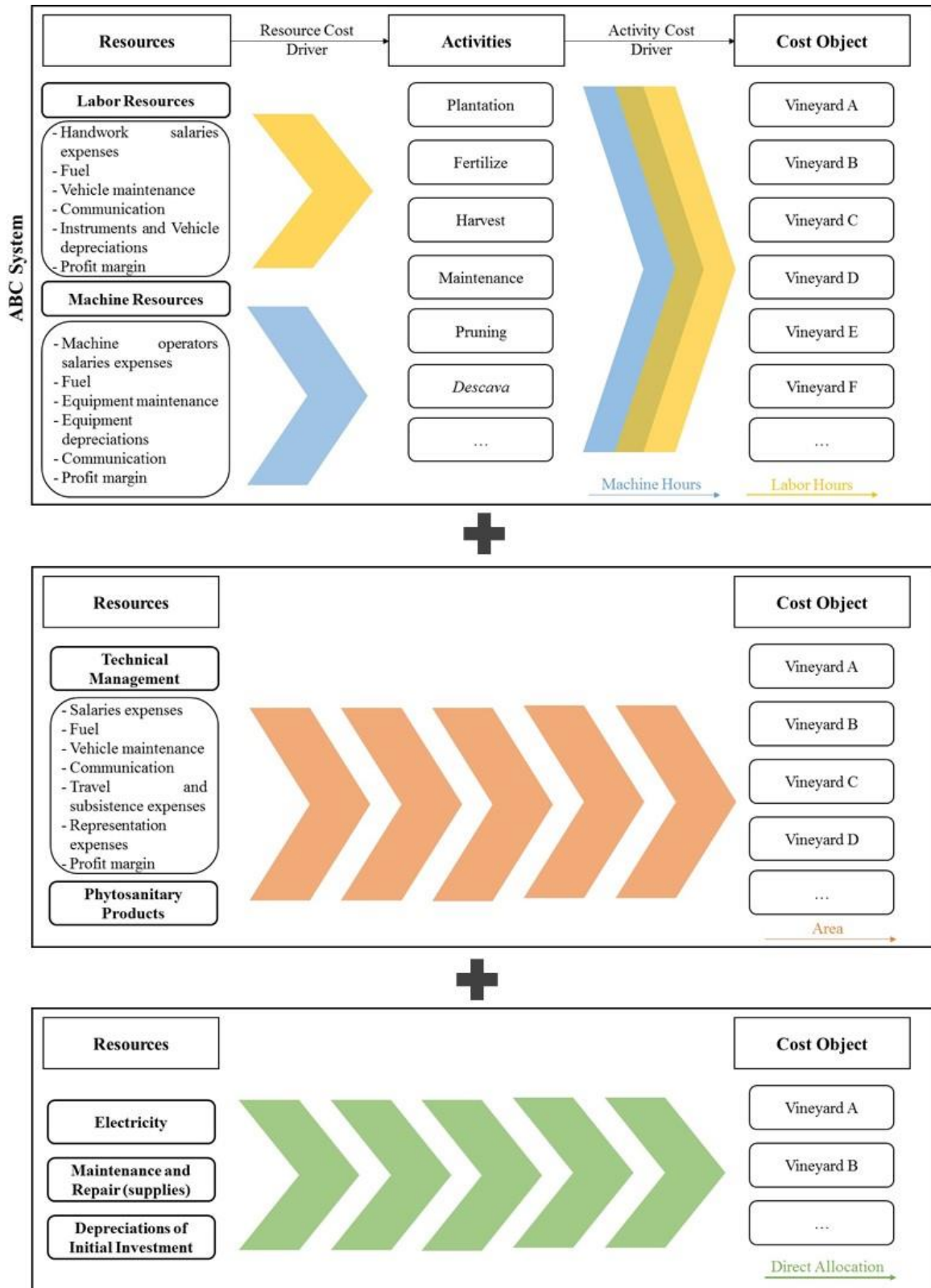
Knowing the total cost incurred in each vineyard and the kilograms of grapes that each vineyard produced, Agro ABC is able to compute the grape cost per kilogram simply by dividing the first by the second. This cost represents the actual cost of production of the grapes coming from each vineyard.

After being harvest, the grapes of each vineyard follow to winemaking process in the winery of its region. Then each winery has several wine brands to produce. In the Finance department they do not know which grape was used to produce each brand, they only know the brands that are produced by each winery. Also, the characteristics of the grapes coming from each vineyard can differ as they can come from different castes, becoming very time consuming to value each grape type. Thus, it is necessary to standardize the grape value by winery. This standard value is the internally called 'Fair Value' of the grapes. To calculate this value, a backwards reasoning is applied: to the market price, the profit margin and all the costs incurred with bottling and enology are reduced, ending with a maximum value the company can support with the grapes. Knowing that value, a subjective reasoning is applied regarding the branding value the grapes have, which is related with the importance of the brands produced by that winery.

Source: Company information in interviews with the Finance director.

Appendix 11

Total vineyard cost calculation diagram.



Source: Own elaboration with company information in interviews with the Finance director.

Appendix 12

Example of allocation process for Vineyard A.

Labor Cost Rate	8 €/hour
Machine Cost Rate	25 €/hour

<i>(Annual Values)</i>	<i>a</i>	<i>b</i>	<i>c = a x 8€</i>	<i>d = b x 25€</i>	<i>c + d</i>
Activities	Labor Hours	Machinery Hours	Labor Cost	Machinery Cost	Vineyard A Activity Costs
Fertilize	40	118	320 €	2 950 €	3 270 €
Winter Pruning	5 306	-	42 448 €	- €	42 448 €
Green Pruning	2 160	-	17 280 €	- €	17 280 €
Phytosanitary treatments	-	501	- €	12 513 €	12 513 €
<i>Raspa</i>	-	-	- €	- €	- €
Herbicides	-	268	- €	6 700 €	6 700 €
Plantation	-	71	- €	1 775 €	1 775 €
<i>Descava</i>	-	-	- €	- €	- €
Irrigation	78	-	624 €	- €	624 €
Harvest	115	-	920 €	- €	920 €
Maintenance	890	-	7 120 €	- €	7 120 €
Trellising	-	-	- €	- €	- €
Binding vineyards	-	-	- €	- €	- €
<i>Retancha</i>	192	-	1 536 €	- €	1 536 €
<i>Ripagem</i>	-	-	- €	- €	- €
Soil Mobilization	-	648	- €	16 200 €	16 200 €
<i>Despampanar</i>	-	313	- €	7 813 €	7 813 €
Pre-Pruning	-	169	- €	4 225 €	4 225 €
<i>Desfolhar</i>	-	-	- €	- €	- €
Others	520	90	4 160 €	2 250 €	6 410 €
Total	9301	2177	74 408 €	54 425 €	128 833 €

Source: Viticulture department documents and information from interviews with both Viticulture and Finance directors.