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B2B Wine Market:
Wine Locker

Candidates: Chiara Cefola

Supervisor: Guido Perboli

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INTRODUCTION

This thesis focuses on the development of a new service that connects suppliers and customers, revolutionizing the logistics and procurement system of wine. The new innovation, called Wine Locker, is a wine distributor located in the customer's internal warehouse, belonging to the Ho.re.ca. system. The objective of the innovation is to modify the management of stocks in a restaurant and at the same time facilitate the sale of wine to the supplier, introducing new stakeholders to manage and maintain the warehouse and promoting the transition to a Just in Time (JIT) system in the delivery of stocks. The new service is revolutionary because it provides for the definition of a "Wine Export Consortium" to protect suppliers, members and collaborators, who supply intermediate warehouses (Locker Distribution) for the correct delivery, by bike, in the last mile, to the Wine Locker of the associated restaurant. The JIT system will therefore make it possible to deliver and supply the product to the restaurant periodically during the day.

The thesis is structured in five chapters, the first two analyze the wine market to introduce the new service and the segmentation carried out for the complete development of the product, performed in the city of Turin. The survey involves 18 city center restaurants who answered questions about their business, the orders placed monthly on wine and the management of their internal wine cellar. The third one focuses in depth on the advantages and disadvantages of the service, the stakeholdes involved and the new procurement process, thus defining the business model and the value proposition. The fourth chapter analyses in a schematic way the strategy in the short and long term linked to the change in the figure of the wine representative and the prototype of innovation. The last chapter instead analyses the results obtained from the formulation of the two costs, warehouse and transport, most influential in the development of the service, numerically evaluating the savings obtained.

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1 LOCKER

1.1 Description of the innovation

Figure 1. Locker

The locker, Figure 1, is a small, usually narrow, glove box. They are often arranged in large numbers, in series and in parallel to form a cabinet. Depending on the use, this locker can also have compartments with a security system, such as a lock or a padlocking system. Often, but not always, they are united side by side. They are commonly found in public places such as changing rooms, work offices, middle and high schools, or as a private use for storing personal items. They vary

in size, purpose, construction and safety. It was recently inaugurated by *Amazon* as a delivery system, useful for those who are away from home.

There are many features to consider when buying a locker (amazon.it and tnt.it):

- *The size of the bank*: it does not refer to the number of compartments present, but to the size of the cabinet itself. A three-tier, two-tier bank, for example, has six compartments, since the total number of lockers is given by the product of the size of the bank (e.g. a three-tier bank) for the number of levels (e.g. two).
- *Levels*: may vary from one level, which is the height of the locker itself, to a maximum of eight, or may increase depending on whether the compartments are small (as with laptops). They can be specified at one level or at eight levels, which means that the cabinets are stacked one above the other at one level, two levels, eight levels, etc. Normally the cabinets have a maximum height of 182.9 cm and the most common levels are one, two, four levels. To obtain the individual height of each compartment, simply divide the maximum height of the cabinet with the number of levels.
- *Material*: The most commonly used material is steel, but often wood, plastic and laminate are also used. Obviously, depending on the use, it is good to identify the most suitable material. For example, in places with high humidity, it is not recommended to use steel because of rust formation.
- *Locking options*: The compartments are individually equipped with padlock or key lock systems. Recently, the security system has been improved by introducing electronic keyboards with password entry.
- *Size*:
    - *Width*: They are often designed with standard widths ranging from 30.5 cm to 38 cm, unless custom sizes are defined.
    - *Depth*: just like the width, the depth also has standard dimensions of 46 cm, unless, as in our case, personalised dimensions are defined.

- *Height*: As mentioned above, the standard height is 182.9 cm, unless non-standard dimensions are defined.

- *Colour*: often relevant for aesthetic purposes. Amazon, for example, in addition to defining a standard colour for the delivery locker, uses the facade of the closet as an advertising promotion for those who own a business or screening a film.
- *Steel thickness*: the cabinets can have a standard steel size of 0.8 mm.

1.2 Objective of the Wine Locker

As described in the previous paragraph, it is easy to see the usefulness associated with using a locker as an object repository. The I3P incubator of the Politecnico di Torino - Innovative Companies Incubator of Politecnico Torino, Treatabit allows young people to develop innovative start-ups, such as that of Federico Mecca and Ile Petrov: TrediVino. The emerging start-up, which is described in section 1.4, is an integrated e-commerce, logistics and beverage automation company with a product designer and marketing studio and a privileged network for the sale and distribution of wine. The evolution that we would like to associate with this start-up is to create a wine bottle locker, known as Wine Locker (WL), able to store bottles and bag-in-boxes of wine in the internal warehouses of interested customers.

The change that we want to undertake in the study of this new system of management of the supplyes is born mainly in consequence of the technological progress, which is projected in a computerized world always tied to the improvement and the optimization of the costs with relative improvement of the efficiency. Technological retort management systems are now widely used, but less in the field of catering and therefore especially in the system Ho.re.ca (Hotelleria-Restaurant-Café) or the world of distribution to restaurants, bars, hotels, pizzerias and catering. The problem that has arisen concerns the management of one's own "wine cellar" of wines inside a restaurant and all the problems with its procurement. As will be discussed in section 3.3, the costs and

time used to supply the wines are a tedious problem for restaurateurs, but also, and above all, for suppliers (wineries, oenologists, consortia) who find themselves in financial difficulties due to unpaid payments or early closure of associated restaurants.

The objective of this innovation is to be able to store bottles of wine within a safe and efficient system that allows the customer to pick up the desired wine at any time and to pay only for the actual use and withdrawal of the product. The locker then takes on the appearance of a vending machine equipped with a software system that allows the customer, in absolute comfort, to pay at the time of the actual need for use. An illustrative example was provided by *Winnsen Industry Co., a* Chinese manufacturer and trading company specializing in the sale of vending machines, which created a vending machine for wine bottles, Figure 2. Another example is provided by an entrepreneur Cesare de Stefani from Veneto who developed the "Winemat", an automatic wine dispenser capable of carefully pushing the bottles and taken from a small lift capable of transporting them to the collection compartment without breaking it (huffingtonpost.it and daint.it).

Figure 2. Wine Locker

At the front of a choice, therefore, the contents of the device, in this case the bottles of wine, will be visible from the outside and accompanied by a label with a detailed description of the product. This new technology solution will therefore make it possible to host a wide range of wines in a practical way and to provide a competitive advantage over other competitors.

Unlike a standard locker, therefore, the Wine Locker will have other characteristics:

- *The size of the bank*: the Wine Locker will host a wide variety of wines. According to the survey discussed in paragraph 2.2, each restaurant has an average of 50 types of wine and at least 60 bottles of each wine. For the ratio to remain constant, each cabinet must contain 1 bank with 10 compartments of 6 levels.
- *The levels:* to accommodate 60 compartments and optimize the space inside the warehouse of your restaurant and allow the restaurateur to pick up their wine in comfort, the Wine Locker will have 6 levels.

- *Security options:* considering the technological progress, the system will be equipped with a software connected directly to your smartphone. Each time the customer selects and pays for the desired bottle, through his smartphone, the electronic system opens the selected compartment allowing the collection of the bottle. The Wine Locker will also be equipped with a screen on its interface so that you can buy the product faster. Subsequently, if exposed to the public, it can be used by the customer to buy bottles of wine.
- *Material:* to preserve the goodness of the wine it is necessary to consider the material of which the Wine Locker will be made. Wine is a product of particular conservation, it is appropriate to evaluate the average conversation temperature and the material that least causes its wear. Among the materials used certainly, having to be the products at sight, you will help the glass.
- *Dimensions*: Each compartments is set up to accommodate only one bottle, therefore, considering that one wooden box per bottle has the dimensions of 35 cm × 11 cm× 34.5 cm, and considering that it has at least 50 bottles types of wine, we can estimate that the locker will have dimensions 85cm×121cm×35 cm. In addition, it was decided to aggregate the purchase of bag-in-box on the basis of the device. Therefore, the final size of the Wine Locker must be 88 cm×99 cm×35 cm. Paragraph 3.6 will describe the numerical data that led to these values.
- *Thickness, Colour:* for these characteristics the standard values can be used, as the thickness of the cabinet is not relevant for the product it contains, while the colour is not relevant for aesthetic purposes, as the Wine Locker is located in the restaurant's internal warehouse and, consequently, is visible only to the service staff.

The WL system has been implemented in order to offer an advantage to restaurateurs and wine suppliers, so that both parties can simplify the ordering and delivery steps and also significantly reduce costs and increase revenues, this part will be discussed extensively in chapter 3.3.

1.3 Smart Vending Machine

Vending machines have always been part of everyday life. Over time, they have increasingly adapted to the needs of a wider range of users, reaching the potential of today's technologies that make these systems increasingly "intelligent" and efficient.

The vending world, an English term for the automatic distribution channel, is one of the great revolutions of recent times. Vending machines have existed since 1963, the difference in recent years is that systems have become "smarter.

The future is therefore linked to an increasingly immediate service: thanks to the Internet connection it is possible not only to speed up the process of selling the product, but above all the storage of data. The smart vending system allows you to communicate in real time the status of the distributor with the central via a cloud platform integrated with a management program accessible to operators. The new distributors allow you to keep track of the products sold, the state of stock and even the collection, as well as malfunctions, temperature of the distributor and thus facilitate routine and extraordinary maintenance and efficient management of the warehouse. The real revolution of the smart vending system is the advantage that it also offers in terms of economy and timing. Having full traceability of the system, the customer does not necessarily have to take inventory or take into account the missing products because the system automatically signals product shortages and thus also the order for replenishment. The Internet also allows payments via credit cards or other payment systems that require real-time checks, but not only, it also makes it possible to choose the product via smartphone, or check the products and choose / pick them up at the first distributor available. The latest data on the market processed by *Accenture* for *Confida*, the national association of the sector, show that in 2016 the market of automatic in Italy has more than 800 thousand machines (+0.23% compared to 2015) and generated a turnover of 1.8 billion euros (+0.48%), for a total of almost 5 billion drinks (+0.47%), including hot and cold drinks, snacks, ice cream and ready meals (venditalia.it). The growth of the vending machine market in 2017 is mainly due

to the growth in the consumption of beverages (+5.01%), which account for 19.7% of total deliveries (Carlo Andrea Finotto, Il Sole 24ore, vending *machines, comes the hyperamortization. Increasingly smart selling,* 2018).

The idea of smart vending machine is applied to the Wine Locker by creating the model "Smart Locker". The smart locker has the same features as the smart vending machine with the only difference of owning a series of compartments rather than the classic helical spring. This system is preferred both for an economic issue, as the presence of a helical spring to support bottles of wine would also involve the "intelligent lift" with conveyor belt, but also for a matter of aesthetics. The compartmentalized smart locker would allow the customer to show in a less grotesque way a well-stocked and elegant "wine cellar" and to pick up the wine with ease. The smart system, as such, is equipped with a software with connection to the smartphone for more effective management and faster selection of wine but especially the ability to have a report always accessible. Therefore, the customer will always have access to his wine collection via his smartphone and can easily pay via it.

1.4 BAG-IN-BOX in the Wine Locker

The Bag-in-Box (BIB) is a container used for the storage and transport of liquids. It was patented in Australia in the 50s, is a flexible plastic bag (BAG) carried in a box (BOX), Figure 3.

Figure 3. Bag in box (www.inboximballaggi.it)

Thanks to its chemical components, the bag protects the contents from external contamination, temperature changes and light. The innovation in this sector is the long term conversation of the liquid contained in it, because, even after being tapped, the opening/closing valve does not allow the entry of oxygen into the bag, preserving the goodness and quality of the liquid. The liquids can be of various nature, from fruit juice to wine to the classic carbonated drinks. It is easy to understand the usefulness of such containers in relation to wine because of their difficult storage, the ease of wear and tear and the need to serve them always "fresh" at the table. The innovation of the BIB would allow the wine to keep easily and to preserve its goodness even after opening the valve and then after its delivery. Another important solution offered by the BIB for wine is the capacity it can support. The wine can be served in "bags" of 3 liters (Northern Europe), 5 liters (maximum consumption in Italy) up to a maximum of 10-20 liters (vinicartasegna.it, 2018). In addition, the ease of long-range transport without special supports, which instead, a traditional box of wine should consider to avoid bumps and breaks.

To understand the relationship between the Bag-In-Box and the Wine Locker, it is necessary to describe the new integrated e-commerce, logistic and beverage automation reality with a product designer and marketing studio and a privileged sales and distribution network called TrediVino. TrediVino is an innovative start-

up of FoodTech specializing in the wine trade that creates an e-commerce network strongly linked to the idea of the BIB. The system developed is called Tulì, it is an interconnected Wine Dispenser IoT, which collects through the platform TrediVino, chills and preserves the flavor and quality of exclusive wines, made by expert winemakers, in the best wineries in Italy, served as only a sommelier can do. The Tulì obviously focuses on the sale of wine in BIB and then on the possibility of tasting the wine glass after glass, maintaining the same goodness and "freshness" of the wine just opened. Unlike the classic online wine sales system, TrediVino specializes exclusively in selling wine in BIB, creating an advantage to the customer over other similar services, such as *shopbaginbox.com, divinosfuso.it, Amazon and eBay*, offering a wider and more specific variety of wine in BIB to the customer and the ability to buy it individually or in stock.

Since the idea of the WL was also conceived by the founders of TrediVino, it was decided to add to the basic wine distributor also a part dedicated to the sale of BIB containers. This creates an added advantage both for those who use Tulì in their restaurant and, therefore, can have a continuous supply of bags, and can be used as an incentive to buy the latter for those who do not have it.

The assembly of a WL of wine and BIB allows to have in its warehouse a wide variety and type of wines, to be served both in bottle and in glass. In this way the restaurateur can satisfy a wider consumers and at the same time save on costs by obtaining the same revenues. The use of Tulì allows you to save on the waste of wine that you have every day in the various restaurants serving in a glass.

In this way, the BIB in the WL would be directed not only to the Ho.re.ca system, but also to the private individual who wants to have a small warehouse of wines at home, always available, and to be able to benefit from a continuous supply of his favorite wines. The Tulì system has been designed for both sides, the same, therefore, has been amplified at the Wine Locker. The Wine Locker thus becomes the most efficient system for managing wine.

2 MARKET ANALYSIS

2.1 Overview of the wine market.

The wine market is a rapidly growing sector.

Although 2017 was one of the leanest years, 2018 turns out to be one of the fattest: 282 million hectolitres of production. Not only did Italy find itself in its best year, but also Spain, France, the United States, Argentina, Chile and Eastern Europe. Production in 2017 was just over 250 million hectolitres, fortunately, with consumption of 240 million hectolitres this year and 30 million industrial uses, the deficit has been recovered.

As shown in Table 1, Italy maintains a market share of 17% in wine production, with an estimated 48.5 million hectolitres.

The OIV estimates that production in 2018 is the highest in at least 5 years, Europe earns an increase of 7% over historical levels and about 18% over 2017. Both Italy and France have increased their production by about 3-4% compared to historical averages, while compared to 2017 it has increased by about twice as much.

There is a significant increase for the countries of South-East Europe such as Hungary and Romania, which have seen an increase of 30-40% compared to the historical averages, also Spain and Germany with an increase of 10% compared to the historical averages.

In the rest of the world, however, the increase was less intense due to climatic conditions, you can see improvements in America with their maximum production of 23.9 hectoliters, but not in Australia and New Zealand, improvements instead have in Argentina and Chile.

Produzione mondiale di vino (hl/milioni)

Hl m	2010	2011	2012	2013	2014	2015	2016	2017E	2018E	Media
Italia	44.7	40.6	38.3	45.0	39.7	48.6	51.6	43.8	48.5	44.1
Francia	44.4	51.1	42.1	42.4	46.7	47.8	44.4	36.7	46.4	44.5
Spagna	34.8	32.5	30.4	44.7	38.2	37.2	38.8	32.1	40.9	36.5
Germania	6.9	9.1	9.0	8.4	9.2	8.9	9.0	7.7	9.8	8.9
Portogallo	7.1	5.6	6.3	6.2	6.2	7.0	6.0	6.6	5.3	6.2
Russia	7.6	7.0	6.2	5.3	4.9	5.6	5.2	4.7	NA	5.4
Romania	3.3	4.1	3.3	5.1	3.8	3.6	3.3	4.3	5.2	3.3
Ungheria	1.8	2.8	1.8	2.6	2.6	2.8	2.8	3.1	3.4	2.4
USA	20.9	19.1	21.7	23.6	23.7	21.7	23.6	23.3	23.9	21.7
Cina	13.0	13.2	13.5	11.1	11.1	11.5	11.4	10.8	NA	12.1
Australia	11.4	11.2	12.3	12.3	11.9	11.9	13.0	13.7	12.5	12.0
Argentina	16.3	15.5	11.8	15.0	15.2	13.4	9.4	11.8	14.5	13.6
Cile	8.8	10.5	12.6	12.8	10.5	12.9	10.1	9.5	12.9	10.5
Sud Africa	9.3	9.7	10.6	11.0	11.5	11.2	10.5	10.8	9.5	10.3
Other	29.5	33.1	31.5	35.2	28.8	29.5	32.4	33.8	33.7	34.0
Total	**260**	**265**	**251**	**281**	**264**	**274**	**271**	**252**	**282**	**266**

Fonte: I numeri del vino e OIV

Table 1. Wine production (OIV date)

World wine consumption increased to 244 hl/million compared to 2017. By 2017 there had already been a shift in wine consumption, it is often consumed outside the country of production. The United States of America, with 32.6 hl/million, is confirmed as the world's largest consumer since 2011, followed by France (27.0 hl/million), Italy (22.6 hl/million), Germany (20.1 hl/million) and China (17.9 hl/million).

Table 2 of the OIV estimates world wine consumption in 2016 at 241 million hectolitres, 1 million more than in 2015 (240 million).

The U.S. continues to grow at a rate of between 2% and 3% per annum and ranks first with 31.8 million hectoliters. If we wanted to include Canada's 5 million, we would reach a North American level of 37 million hectolitres, about 4 million hectolitres more than the 33 combined hectolitres of the two states in 2011. Italy is the leader in this market for quantity and quality produced and recognized especially abroad.

Estimates for 2016 confirm a new positive figure for Italy, which seems to have risen to 22.5 million hectolitres (+5%). In Italy, the wine market has achieved a turnover of 2017 of 14 billion, of which 12.32 billion from bottles.

Consumi mondiali di vino - dati OIV									
HL/MIL	2008	2009	2010	2011	2012	2013	2014E	2015E	2016E
TOTAL	251.3	243.3	242.7	244.3	243.6	243.0	239.1	240.0	241.0
USA	27.7	27.3	27.6	28.4	29.0	30.2	30.4	31.0	31.8
FRANCE	30.8	30.2	29.3	28.3	28.0	27.8	27.5	27.2	27.0
ITALY	26.2	24.1	24.6	23.1	22.6	21.8	20.4	21.4	22.5
GERMANY	20.7	20.2	20.2	19.7	20.3	20.4	20.2	19.6	19.5
CHINA	14.0	14.5	15.2	16.3	17.1	16.5	15.5	16.2	17.3
UK	13.5	12.7	12.9	12.9	12.8	12.7	12.6	12.7	12.9
SPAIN	12.2	11.3	10.9	9.9	9.3	9.8	9.9	10.0	9.9
ARGENTINA	10.7	10.3	9.8	9.8	10.1	10.3	9.9	10.3	9.4
RUSSIA	11.8	10.4	12.2	11.3	10.8	10.4	9.6	9.3	9.3
AUSTRALIA	4.9	5.1	5.4	5.3	5.4	5.3	5.4	5.3	5.4
CANADA	4.0	4.1	4.3	4.3	4.9	4.9	4.7	4.9	5.0
PORTOGALLO	4.5	4.5	4.7	4.7	5.0	4.8	4.7	4.8	4.6

Table 2. Wine consumption (OIV date)

From ISTAT data, we can see a slight decrease in the penetration of wine consumption, table 3, from 2007 to 2017.

Consumo di vino per eta' - % sul totale popolazione											
%	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
11-15	2.6	2.9	2.8	3.3	4.4	3.2	4.8	4.4	5.3	4.7	6.9
16-17	16.6	18.0	15.5	16.1	16.0	14.1	18.2	17.9	22.9	19.3	23.0
18-19	36.1	33.9	34.5	28.9	32.0	29.4	33.3	34.5	33.0	29.1	35.7
20-24	45.8	45.7	42.5	40.4	41.9	43.3	41.5	42.5	41.8	43.4	41.8
25-34	54.9	52.4	54.5	52.1	53.1	52.2	54.9	52.0	54.7	53.1	55.5
35-44	57.5	56.5	57.1	54.6	55.9	57.0	58.3	57.9	58.2	57.9	58.7
45-54	59.0	58.4	58.8	56.5	57.7	58.9	61.2	61.8	62.0	62.9	64.9
55-59	58.4	59.4	61.2	59.0	62.2	61.5	64.1	64.8	64.1	62.4	64.8
60-64	60.1	61.7	60.2	59.7	60.6	62.4	63.2	63.6	63.8	64.8	65.2
65-74	58.6	59.3	59.2	58.3	59.7	60.5	60.2	61.4	62.1	61.1	60.0
75 e più	54.0	49.9	52.4	51.2	49.7	50.5	51.0	52.8	53.7	53.0	52.5
Totale	**52.6**	**51.7**	**52.2**	**50.5**	**51.6**	**51.9**	**53.3**	**53.3**	**54.0**	**53.4**	**54.4**

Fonte: ISTAT

Table 3. Wine consumption by age (ISTAT data)

It can be noted that consumers aged 45-54 years who consumed wine in 2017 represent 59.0% of the total population considered, the same as in 2007 (i.e. those aged 35-44 years), were 58.7% of the population. It can be seen, therefore, that there has not been an increase in the penetration of consumption. On the contrary, in 2017 children aged 25-34 represented 54.9% of the population, the same children that ten years earlier represented only 41.8% (20-24 year olds).

Therefore, graphically, the curve grows up to the age of thirty years and then settle around forty, and decrease in the last bands, it is sufficient to compare the last band with a value of 52.6%, ten years earlier, 60%. The 20-24 year-old age group, which has seen a 10% increase in recent years, is significant. This is a positive confirmation of the trend in this sector.

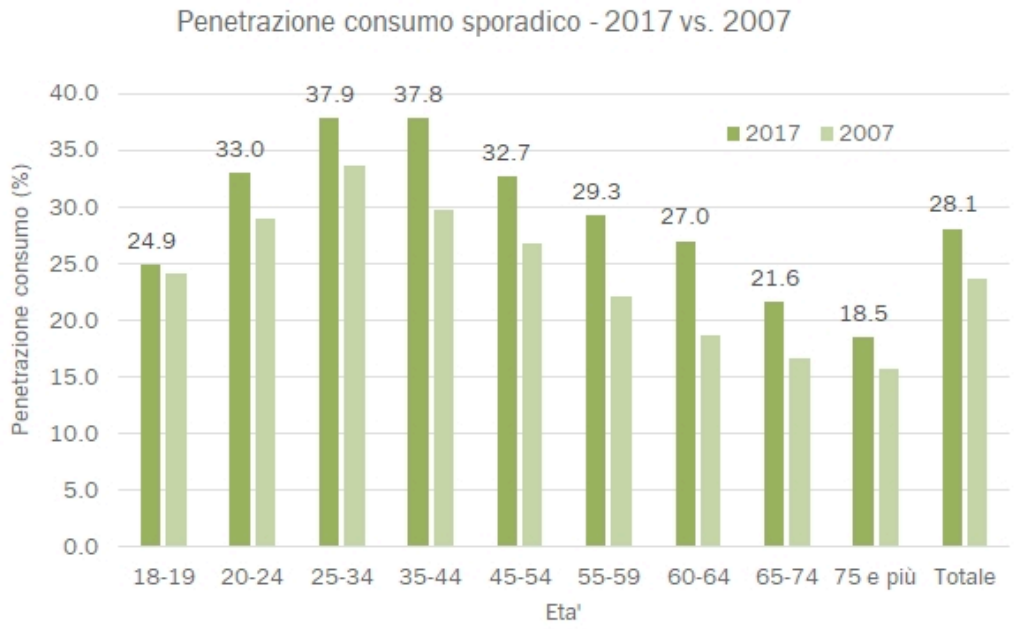

Figura 4. Graph of wine consumption by age

Figure 4 graphically represents the growing penetration up to the 30-year-old age group, which has since declined in recent years.

Penetrazione consumo vino nelle regioni italiane - dati ISTAT							
(% popolazione)	2011	2012	2013	2014	2015	2016	2017
Piemonte	56.1	52.3	50.7	53.5	56.1	54.1	55.9
Valle d'Aosta	63.2	56.3	59.2	58.1	55.5	58.9	58.5
Liguria	56.9	58.8	55.9	53.4	53.4	55.0	56.2
Lombardia	57.1	53.8	51.8	51.8	55.5	53.3	54.9
Trentino-Alto Adige	54.1	52.5	56.1	54.8	51.6	53.1	57.3
Bolzano - Bozen	58.2	57.1	59.1	56.2	55.7	56.1	60.7
Trento	50.3	48.1	53.3	53.4	47.7	50.1	54.1
Veneto	56.6	58.4	57.5	53.6	57.2	54.5	57.5
Friuli-Venezia Giulia	57.4	57.6	56.0	57.9	55.7	60.0	58.1
Emilia-Romagna	59.4	57.3	58.7	58.0	60.8	58.8	59.5
Toscana	56.5	55.6	57.3	52.4	57.9	56.6	56.1
Umbria	55.0	53.0	55.3	53.3	56.4	54.6	57.6
Marche	55.9	58.3	56.4	54.0	57.7	57.7	60.4
Lazio	54.7	52.1	50.8	48.0	48.8	52.1	49.8
Abruzzo	52.6	49.6	50.6	48.2	56.6	52.0	51.3
Molise	48.6	49.4	47.1	48.4	47.7	48.7	47.4
Campania	48.8	47.4	47.2	47.2	45.4	45.0	46.8
Puglia	46.6	45.4	48.1	45.3	44.9	50.5	49.8
Basilicata	48.3	44.6	45.7	43.9	46.5	47.5	44.9
Calabria	50.2	45.4	50.3	47.4	47.9	45.8	47.1
Sicilia	41.3	44.8	41.5	43.0	42.1	41.0	42.7
Sardegna	49.3	45.6	47.6	46.7	48.1	45.3	46.5
Nord-ovest	56.9	53.9	52.0	52.5	55.4	53.8	55.3
Nord-est	57.5	57.4	57.7	55.9	57.9	56.6	58.3
Centro	55.4	54.1	53.9	50.6	53.4	54.4	53.7
Sud	48.7	46.7	48.2	46.7	46.8	47.6	48.1
Isole	43.3	45.0	43.0	44.0	43.6	42.1	43.6
Comune centro dell'area metropolitan	55.4	54.8	51.1	52.1	51.9	53.4	54.3
Periferia dell'area metropolitana	54.0	52.4	51.9	51.5	52.7	50.7	52.6
Fino a 2.000 abitanti	54.2	49.9	51.4	50.7	52.4	51.6	51.7
Da 2.001 a 10.000 abitanti	54.0	50.7	51.0	50.2	52.3	52.7	53.5
Da 10.001 a 50.000 abitanti	51.4	50.9	50.1	49.4	50.8	50.4	50.8
50.001 abitanti e più	52.7	53.0	54.8	50.3	53.9	51.7	53.0
Italia	53.3	51.9	51.6	50.5	52.2	51.7	52.6

Table 4. Wine consumption by region

Turning to the geographical areas, Table 4, the data are fluctuating but the trend is negative, especially in the south. Looking, for example, at the Lazio region, the comparison between 2017 and the two previous years shows negative data, as do Puglia, Basilicata and other regions of Southern Italy.

2.2 Market segmentation

In order to describe innovation in an efficient and effective way, it will be considered a small market because in this way it is easier to understand consumers and their problems and needs.

The reference market is that of restaurant in Turin, Piemonte. Since in the first phase a collection of information and data is needed and then analyzed, the first research will be considered as a face-to-face interview. Compared to other forms of data collection, such as e-mail, telephone or online survey, the face-to-face interview/survey system is the most accessible when you are on site.

For the analysis in question, 18 restaurants in the Crocetta/Center di Torino area were interviewed. This area is one of the best known and therefore also the most touristy in the city. Each of these restaurants was asked some questions about the stages of supply of wines, from which the thesis in question was extrapolated. However, the data are estimates and assumptions regarding the results obtained from the interviews.

In the world of restaurant business, it is possible to distinguish between various types of restaurant:

- Starred restaurants;
- Restaurants offering medium-high quality wines;
- Restaurants and pizzerias;
- Trattorias and farmhouses.

Since the analysis requires that each restaurateur has a high turnover and the need to have a varied and extensive wine list, only medium-high restaurants and pizzerias have been taken into account. Starred restaurants, despite having an extensive wine list, also require a cost and a type of wine necessarily calibrated to the dishes they offer and to the stars they own. Since the Wine Locker is designed as a distributor of wines from associated producers, the analysis showed that wineries that produce high quality wines and that are therefore part of an

important circle of particular restaurants, are not willing to give up so many requirements that the Wine Locker would require. In addition, a starred restaurant must own an expensive wine cellar, a value that the Wine Locker could own, but being in its early stages of life is not yet able to sustain. On the contrary, the restaurants and farmhouses have been excluded for the limited wine list, the use of the Wine Locker would be inconvenient not only for the restaurateur but especially for the producer who would supply types of wine that the restaurateur would not be able to sell.

Ultimately, in our analysis are mainly considered restaurants of medium-high quality and restaurant-pizzerias that, although they offer other beverages in addition to wine, allow a high turnover during lunch.

A restaurant can also be classified according to the number of seats it offers. Our analysis will cover restaurants with a minimum of 70-80 seats and a maximum of 150-180 seats. Small (<70 seats) and large (>180 seats) restaurants are excluded because the data would be, in the first case, untrue because they are reductive; in the second case, too extensive and not very focused.

To this end, 18 restaurants (Annex 1) were analysed and surveyed to obtain the data used in the drafting of the project.

The results obtained are presented in Table 5.

	Average	number wine labels / categories
seats	108	
wine labels	52	
labels types:		
high	11%	5
medium	68%	35
low	20%	10
bottles sold/days	12	
bottles sold/gg types:		
high	1	
medium	8	
low	3	
best-selling labels:		
high	2	
medium	7	
low	4	
payment type:		
30 days	0%	
60 days	61%	
90 days	33%	
at delivery	0%	

Table 5. Average survey restaurants

2.3 Industry Attractiveness

The model, that explains how attractive an industry can be, is represented by Porter's five forces. It explains the position of the company in a given sector.

This model is related to the profitability of a sector and how as these forces increase is less the ability of companies to raise prices and increase their profitability.

Porter's five forces are[1]:

- Barriers to entry;
- Bargaining power of suppliers;
- Bargaining power of consumers;

[1] Informazioni ottenute da Harward Business Review, *The five competitive forces that shape strategy,* Micheal E.Porter, Jenuary 2008.

- Substituted products;
- Level of Rivalry;

Each of these forces will be related to the wine market.

The threat of new entrants is low to medium for the wine market in Europe. There are many small and medium enterprises already started or many small family enterprises that continue for generations with their own brand. Moreover, the costs to enter the market are remarkably high, each SME must have a land, machinery and an ideal climate for the cultivation of grapes. Despite this, there are no economies of scale and wine, although, erroneously, it is considered a differentiated product, in reality today the consumer is not yet a professional connoisseur and loves to try various types of wine. Moreover, being an alcoholic beverage also entails different state costs compared to other types of drinks. From the point of view of the restaurant, the threat of new entrants is high, today anyone can open a restaurant, the duration of the latter, however, may be uncertain.

The bargaining power of consumers is high, however, and it is they who have control over the product. They are very price sensitive because they have the ability to continuously change product or label. There are many dealers and channels available and allow them to have the power. Obviously, with reference to wine, having a detailed knowledge of the product would allow them to be more selective, but the wine is often evaluated by the customer only on the basis of its selling price. A 5€ wine is considered of medium-high quality.

The bargaining power of suppliers is therefore much lower because they cannot afford to significantly raise the selling price of a bottle of wine, as consumers are very price sensitive. Demand is inelastic because a significant price increase leads to a decrease in quantities sold. Obviously this is the case for inexperienced consumers, but they make up the majority of customers. In the case of experienced consumers, it is explicit that the bargaining power of suppliers is much higher.

Internal competition is low to medium, there are many wineries in Europe that produce wine but compete with each other in sectors. In the world of wine we

have to distinguish between low, medium and high quality; some companies compete with each other only for certain types of wine and normally, for example in Italy, each region has its own DOC wine. Competition is therefore reduced in the state but relatively higher in the region. In conclusion, however, it is not a force that negatively affects the sector because the various companies do not compete on price but only on the quality of the product.

The threat of substitute products is medium to high. In Europe, as in other parts of the world, wine is often referred to as "produced by special occasions", other drinks such as beer, cocktails or spirits are "produced by special occasions". For this reason, substitute products are binding and often substituted for wine. The price factor is also significant and affects the willingness to pay of consumers who are often more inclined, not being passionate, to prefer a product at a lower price than those at higher prices. Beer has a considerably lower selling price than wine.

In conclusion, since all the forces are low on average, the market is described as a highly attractive and therefore profitable sector.

3 BUSINESS MODEL

3.1 Business Idea

The reference market, described in the previous chapter, describes the possibility of directing the company towards both the B2B model (business-to-business) and the B2C model (business-to-client).

The two models essentially change the installation of the Wine Locker and the ultimate goal. In the first case we speak of WL installed in the internal warehouse of a restaurant, with the aim of having a stock of wine always available bottled. In the second case, the WL is intended for the private individual who owns the Tulì and wants to have a recharge near the places he frequents most.

The thesis in question will refer only to B2B, so the customers will be:

- The restaurateurs, who will benefit from the installation of the WL at their personal warehouse. In order to encourage them to choose to include it in their restaurant, they will continue to have the same freedom to define the selling price of the bottle of wine.
- The wine suppliers, in our case identified with oenologists, wineries, wholesalers and distributors who will benefit from the primacy of single supplier at the chain of restaurants attached to him.

The system changes the logistics network of wine distribution. As will be described in sub-paragraph 3.6.1, the process of supplying wine at this time involves a direct relationship between the restaurateur and its supplier, with the Wine Locker, however, the relationship between restaurateur and supplier will be eliminated. The new logistic network foresees the passage of the goods from the production chain to the restaurateur through a platform that will be defined as "Locker Distribution" managed by a "Consorzio Wine Export" (CWE). This

platform, by its nature, takes on the appearance of a network for storing goods. The consortium is an insurance for both the restaurant and its suppliers because it allows the reduction of warehouse costs, assumed by the platform (over a certain amount), and the related transport costs, also assumed by the platform. The Wine Export Consortium, being an association, does not have a competitive purpose but a collaborative one, since the sale of a product benefits the entire platform of member companies.

The consortium considered is legally known as "consortium with external activities", which deals with the management of a service, it also follows the performance of activities with third parties.

The network of producers that will be part of the platform will be the only direct supplier of the restaurants and supplier of the associated Wine Lockers.

3.2 Stakeholders

The BTB model will therefore focus on the relationship between wine suppliers and the restaurant business.

The offer of the Wine Locker completely changes the "chain of relations" that exists between the supplier and the Ho.re.ca. system. Before describing the differences and similarities, in this paragraph we will analyze all the characters that come into play distinguishing between restaurateurs, suppliers and producers.

In the Ho.re.ca system (Hotelleria-Restaurant-Café), the world of distribution to restaurants, bars, hotels, pizzerias and catering, restaurateurs are the main customers to whom our offer is addressed. Considering that the Wine Locker will house a wide variety of bottles of wine, bars and hotels will be eliminated from our survey, as they do not have a high turnover. The innovation could affect the catering sector, even if to a lesser extent, since, as for bars and hotels, a high turnover is necessary, which allows, therefore, a constant periodic supply of the

same bottles, to have collection and sale. As specified in paragraph 2.2, for a matter of data analysis, we will consider a small group of 18 restaurants.

It is important to understand the distinction between wine producers and suppliers: wine producers are the producers of wine bottles, some of them can also be direct suppliers of wine, in this case we talk about direct sales. In most cases, however, manufacturers only sell their products to suppliers, who are responsible for supplying the product to the various customers.

Among the wine producers we have the classic wineries of the territory, in other words industrial companies with direct production.

The suppliers, on the other hand, can be divided into various categories:

- *Representatives/Agents:* the agent is responsible for promoting commercial contracts between the client company, for which it acts on behalf of and for the account, and the potential client, in this case the restaurateurs. It operates in a precise territorial area. Normally he takes on the business risk, because it is to him that the earnings of a company are linked. Agents are distinguished by:
  - Monomandatories: they represent exclusively a company, a territorial extension of the sales network. Such agents are rare or present to a lesser extent because it is difficult for a restaurateur to bind himself to an agent of a single company, in which case, direct sales are easier.
  - Multiple agents: represented more than one company in a defined territory.
- *Wholesalers*: they usually buy from the manufacturer to sell to retailers, in other words they are indirectly produced merchant companies. Unlike the representatives, wholesalers deliver the goods and assume no risk. It has less quantity than the large distribution. However, thanks to the double shift from a manufacturing company to a "sales shop", the selling price of individual bottles has a lower reload, in other words, it is sold at a lower price than direct sales.

- *Retailers*: chains that have a direct contact with the final consumer, these can buy directly from the manufacturer or go through the wholesalers.
    - *Wine shop*: In this category you can taste and buy wine.
    - *Export Consortium:* an association of companies with a common or associated economic activity, the purpose of which is to achieve the financial interests of the participants (member companies). They are obliged to cooperate, not to compete, for a common goal. In the case in question, these are consortia with external activities aimed at carrying out activities with third parties.
- *Large-scale retailing (GDO): a* system of retailing through a network of supermarkets or intermediaries. Unlike the wholesaler, he has more product in stock and it is therefore easier for the customer to find the desired product. The large-scale retail trade is mainly used by restaurants that want to have a niche of different types of wine, different from those commonly sold, in their cellars. In this case, the GDO offers the possibility to buy, for example, three bottles of a particular Sicilian wine without obligation on the purchase of the entire package of six bottles. Some examples of large-scale retailing are "*Cash&Carry"* and "*Metro"*.

From the new model developed, it is possible to define the new characters who enter the Wine Locker system.

The new characters, even if the same ones listed above, take on different roles.

The new system is divided into several "locations", since the success of the innovation is offered by the speed of delivery of the product, it is essential to define various areas of management.

The classic producers/suppliers listed above will continue to be part of the wine supply routine, with the difference that they will be exclusively "wine sales outlets". All the various relationships that in the current system are essential for the purchase and sale of the product, in the new system will be significantly reduced. As mentioned above, the only reporting figure in the new scheme is the CWE. This deals with the relations between all the consortium bodies and their

respective clients. It will also be responsible for the management of the internal and external representatives, which will be described and developed in section 4.1. To simplify the explanation of the protagonists of the system, we bring the vision to the figure below, Figure 5.

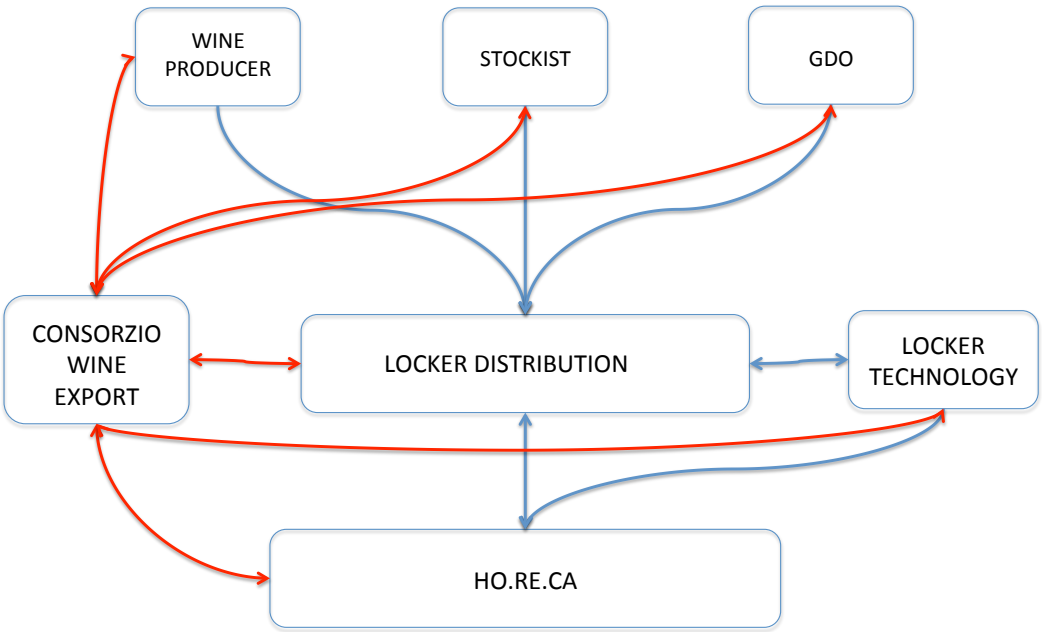

Figura 5. Logistic scheme of business model

The new figures that intervene are (Figure 5):

- Locker Distribution (LD): the platform for the storage and transport/delivery of goods. This platform manages every entry and exit of the product, then manages all the stock present with its turnover and what is related to the transport of goods to restaurants.

  In detail, Figure 6 instead describes the various steps and intermediate locations between the Locker distribution and the restaurants: each region will be provided with a "Regional Locker Distribution" (RLD), this

platform will be the main supply warehouse of any city. Each city will in turn be equipped with another "Locker City Distribution" (LCD) platform which will be the city's basic warehouse. The latter will directly supply some smaller warehouses in areas of interest, in correspondence with areas of the city with a high density of restaurants, obviously linked with the Wine Locker. These areas will be wine shops that will be part of the innovation and will collaborate in the system getting a small percentage from the storage. Each area is also directly connected with the restaurants in the area.

A representation of such a mechanism, for example, has as RLD a warehouse in the city of Cuneo that supplies the city of Turin, representative of the LCD, which supplies various areas of the city such as Largo IV Marzo, Piazza Solferino etc..

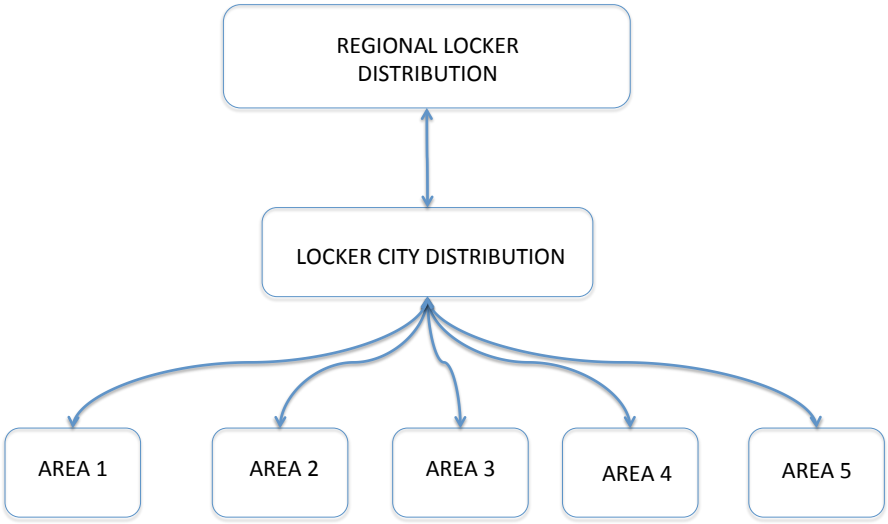

Figure 6. Logistic werehouses scheme

- Locker Technology (LT): represents the team of creators of the Wine Locker and the software and application developers who will use the restaurateurs to take advantage of the service. These also deal with the

receipt of payments and data analysis, within it there is also a management team that reports directly to the CWE.

- Wine Export Consortium (CWE): As described above, it is at the heart of the innovation and supply chain attachments. Defines the system of collaboration and control and manages the entire system of Wine Locker. The different colours of the connections in Figure 5 represent the different relationship between them. The CWE does not act directly, but indirectly manages the whole system.
- Ho.re.ca: As described above, it is the end customer of the system who will benefit from the service. It is therefore linked to the supply chain and the LT that will supply the Wine Locker.

3.3 Wine Procurement Process

3.3.1 AS IS

In this paragraph we will focus on the procurement process, and therefore on the steps that stakeholders, analysed in the previous paragraph, must take to obtain the necessary products, in this case, the wines. A small group of restaurants in the city of Turin, Piemonte were considered to describe the procurement process in a more likely way. As analysed in section 2.2, the market segmentation is more satisfactory if analysed for a small group of people, in this case in the restaurant sector, who might be interested in the Wine Locker service.

The analysis carried out showed that the procurement process always consists of five steps:

1. *Supplier Search*

This point is not a step that the restaurateur takes periodically, but it is relevant to describe the proposal for innovation.

The restaurant offers a varied wine list, which can contain several labels. Each restaurateur presents in his cellar different labels of wines, which are produced and sold by different wineries and suppliers. Each winery, in fact, produces some types of wines that characterize its territory, according to its raw material. These companies rely on representatives, who come into contact with restaurateurs and define the contractual terms. Therefore, each agents may represent several companies. The survey showed that each agents represents a minimum of three companies and a maximum of five. Each restaurant chooses the representatives it prefers, often in relation to the type of menu proposed. In addition to the representatives, the restaurateur can also rely on the large distribution. Often the cost of purchase in large distribution is much higher than that offered by the companies, because they sell a few quantities of a certain wine, first purchased from the producer. The large-scale distribution is used by restaurateurs for the pleasure of having in their cellar some particular wine and outside the regions that they normally serve.

The first step in a good restaurant is to define its suppliers. The survey showed that 60% of the wine list is offered by representatives and only 20% is offered by mass retailers, the remaining part is direct sales. Since, on average, each restaurant has 50 labels of wine, 30 of these come from local representatives, the remaining 20 from mass retailers and manufacturers. In addition, each restaurateur relies on at least five representatives, who in turn represent at least three regions.

2. *Inventory*:

Every seven days, the restaurateur makes an inventory of the products used, those in stock and those missing to define, on average, the products he still needs and how many products he does not need. Once a month, he checks the products he has sold and those he has failed to sell. Once a year you make a larger inventory to eventually change your wine list or reconfirm it.

3. *Order up*:

Once you have defined the quantities you need (for our analysis we will focus on the products that are missing and therefore require an order) you contact your supplier, or representative and, the latter, will mobilize for refueling.

However, in order for the supplier to produce and supply its customers, restaurateurs must inevitably order a minimum number of bottles of wine. This condition is necessary in order for the supplier to be able to compensate for the costs it incurs in producing wine bottles. The survey showed that each restaurant orders on average 10-12 cartons of wine from at least 6-12 bottles. Depending on the quality of the wine, it is possible to distinguish:

1. low quality wine: average purchase price €3.5
2. medium quality wine: average purchase price 8€
3. high quality wine: average purchase price 12€

Therefore, considering the above values, each restaurateur has a cost for each order:

1. minimum cost of 210€ = 10 cartons of 6 bottles at a price of 3,5€
   maximum cost of 504€= 12 cartons of 12 bottles at a price of 3,5€
2. minimum cost of 480€ = 10 cartons of 6 bottles at a price of 8€
   maximum cost of 1152€= 12 cartons of 12 bottles at a price of 8€
3. minimum cost of 720€ = 10 cartons of 6 bottles at a price of 12€
   maximum cost of 1728€= 12 cartons of 12 bottles at a price of 12€

However, the survey showed that the minimum cost must be at least € 500, so a low quality wine must be purchased in 12 cartons of at least 12 bottles.

4. *Delivery*:

Once you have placed your order, you must consider the lead time between the confirmation of an order and the actual delivery of the product.

The success of a supplier company lies not only in its ability to satisfy its customers, but rather in reducing the waiting time between the purchase of a

product and its delivery. The competitiveness of a supplier to gain a significant competitive advantage is to minimize lead time. In order to play the winning card, it is also necessary to have an excellent logistical network for the delivery of the product. A key role is played by the chain of partnerships with express couriers and innovative strategies for picking orders and the last mile bike route system.

In the case in question, the suppliers store the wines they have produced while awaiting specific deliveries, thus significantly reducing the waiting time, while increasing the cost of keeping them in stock. This consideration is obtained by the nature of the product requested, the customer does not require a new product (time to market) but the shipment of a finished product (time to order) so it is necessary to be, at least in large part, in possession of that finished product to speed up delivery times. As a result of the high cost of storage and delivery of the product, the supplier must receive a minimum order of 60 boxes of wine, so as to compensate for its expenses. Point 3 before specifies the minimum ordering costs that each restaurant has contractually agreed with its supplier, even if, because of the lasting relationship between the supplier and the restaurateur, these limits are often not respected.

5. *Payment*

Once the application process has been completed, the restaurateur must sell the wine ordered, which in most cases is in larger quantities than those actually required, due, as mentioned above, to the minimum order required by suppliers. The supplier, in contractual agreements with the customer, determines the type of payment. There are different forms of payment available to the restaurateur: ri.ba (bank receipt), bank transfer, cheques, deferred payment or payment on delivery. According to the specific request of the supplier and any negotiations with the restaurateur, each restaurant has the form of payment that best meets its needs.

The survey showed that the payment most used by restaurateurs is the payment deferred to sixty days. In this way, restaurateurs have time to sell the bottles and, once the money has been collected, pay the costs incurred. The disadvantage of the supplier is explicit, he assumes the risk, each time he delivers a pack of wine,

of a loss of earnings. If the restaurant fails to cover its costs, it could lead to financial difficulties and therefore an inevitable risk of insolvency of its business, the unsold product is not paid back to the supplier causing a chain of unpaid invoices.

Moreover, often, because of the relationship of trust that is created between the supplier and the restaurateur, inevitable to retain the customer to their company, the payment is made on dates other than those agreed, or the delay is increased and the payment, therefore, postponed. This system, although advantageous to the restaurateur, is disadvantageous for the supplier who, forced to maintain the relationship, sees his collection faded again.

3.3.2 TO BE

The use of Wine Locker will completely change the wine procurement process:

1. *Supplier Search*

The first step is always the search for suppliers, but with the introduction of the new system takes some changes. The search will be limited to the circle of suppliers who have joined the Wine Export Consortium, therefore, through the associated website, the restaurateur can evaluate the variety of labels and decide which suppliers he prefers. These will be the direct and unique suppliers to the Wine Locker of that restaurant.

Once the labels and their suppliers have been chosen, the restaurateur will have in his personal account a virtual image of his Wine Locker with all the wines present in it and their stock.

2. *Receive customer's order*

At this point, the steps listed in the previous sub-paragraph are all deleted. The only next step is the dinner order from the wine list.

3. *Purchase in the Wine Locker*

Once the order has been received, the person in charge of the restaurant's Wine Locker role, once he has reached the warehouse where it is placed, will purchase the required wine through an app or integrated software with a screen. Once the payment has been received, the box in which the desired wine is contained will open, allowing it to be picked up and actually delivered to the table.

4. *Product transport*

Once the wine has been picked up, the Locker Technology will receive notification of successful picking and purchase of the product, indicating a reduction in the warehouse of that restaurant. The system, keeping the count of the bottles taken, indicates when the stock has reached the minimum value by notifying the area concerned, and then the associated wine shop. After receiving the alarm, the platform is in charge of filling the restaurant with the missing bottles, deposited in the same through the use of green contracts: bike. As it is a computerized system, LT also takes into account the stocks in the warehouse and in case of a deficit it notifies the supplier of the default quantity in sufficient time to allow the production and new delivery in the reference LDs. For both restaurateurs and suppliers the use of cartons of 6-12 bottles represents a real cost with hypothetical revenue, with the new system the cost and revenue will both be real because each withdrawal, and therefore cost, of the restaurateur corresponds to a collection of the supplier and a collection, and therefore revenue, from the selling price of the restaurateur.

Therefore, it is easy to understand how each platform is linked to the next: in case of lack of stocks in the area of interest, LT notifies the platform of the city (LCD), which, in turn, in case of default, notifies the RLD, which in case of deficit notifies the central LD, which consequently notifies the wine producer or wholesaler or large retailer attached. The system is consecutive and binding, but it allows to reduce the lead time considerably, because it recreates intermediate warehouse/platforms in the management of stocks and transport of product, allowing a fast and effective delivery, especially in the last mile.

5. *Product delivery*

Once the system has notified the reduction of stocks and reached the limit indicating the insufficiency of product to meet demand, the LT notifies by app the system of transport and delivery of the product. As described in paragraph 5.2, the delivery service produced in the last mile is served by the cargo bike operators. Every time the Wine Locker is in a product deficit, the biker who is in the reference area (wine shop) of that group of restaurants is in charge of the delivery of the product. Once delivered, an employee chosen by the restaurant must place the bottle in the Wine Locker. In this way, the Wine Locker will indicate that the wine has been supplied.

3.4 Proposition Value

To understand how much innovation creates an advantage for the customer, it is essential to analyze the *proposition value*, in other words the value added to the service for the end customer.

The detailed analysis of the proposition value will highlight the advantages of using the Wine Locker for both stakeholders.

After analysing the protagonists of the service offered, discussed in paragraph 3.2, the proposition value will define the effectiveness of the idea.

Why would a restaurateur buy a Wine Locker? What benefits would it have? What improvement would it make? At the same time, why should a supplier use a Wine Locker to sell his wine? What are the advantages? What would change compared to the current business?

The proposition value answers questions such as those listed above. The points will be clarified in both discursive and numerical terms, the last case being analysed in Chapter 5.

The benefits of the Wine Locker for customers, in our case the restaurateurs of the Ho.re.ca. system, will be analysed below.

- *Cancellation of supply orders*: one of the most important and fundamental objectives of the Wine Locker is certainly the elimination of supply orders for restaurateurs. The Wine Locker is equipped, as a smart vending machine, with an integrated cloud system for data storage, it is able to keep track of each output, and therefore purchase, of product picked. In this way, the restaurateur will no longer need to do periodic inventory control, since the system automatically detects a reduction in inventory of the Wine Locker, and then, whenever a minimum threshold is reached, insufficient, product, alerts the supplier of the need for supply. In this way, it is easy to understand the advantage that the restaurant would gain in terms of reduction of time and capital assets.
- *Payment on use:* the second fundamental objective of the Wine Locker is the possibility of avoiding stock orders to the supplier. The Wine Locker, by its nature, allows the opening of a compartment only upon receipt, through the integrated software system, of the payment of the product being purchased. Once the payment has been received, the system records the product exit and the supplier's cash entry, and allows the opening of the compartment and the subsequent withdrawal of the product by the restaurateur. The advantage for the restaurateur is considerable:
    - *Cost reduction:* As discussed in paragraph 3.3.1 under point 5, payment for the supply is made on average sixty days after delivery. With the new Wine Locker system the restaurateur will no longer have to postpone payment because, by its nature, the Wine Locker allows immediate payment. Therefore, whenever the customer of the restaurant requires a specific wine, the restaurateur can, only at that time, make the expense, and then pay for the bottle, but getting at the end of the evening the proceeds of the sale. The advantage is explicit, the cost is reduced to the extent of the actual use of the product, the collection is secured to the extent of the specific request of the customer of the restaurant.

For the supplier the advantage is similar, he will no longer have to wait for payment at sixty days, or accept postponements of payments in order to retain the customer. The proceeds are immediate. Every time the restaurateur buys the desired bottle, the supplier automatically receives the cash entry. This solves the problem of unpaid revenues.

- *Reduction of warehouse costs:* warehouse costs are considerably reduced for both parties. The restaurateur will no longer have the problem of the small cellar, he will no longer have to find accommodation for many cartons of bottles because the Wine Locker will be the only physical store to consider. Having fewer bottles of the same type, because, as will be discussed in paragraph 3.6, it will have 66 bottles, so the storage costs incurred are reduced as a result of the lower quantities of wine present. The supplier also has reductions in inventory costs because it will change sales methodology from push to pull. The push system is the one widely used, to store finished products in the warehouse waiting to be sold; with the Wine Locker suppliers will switch to a pull system in which only what has been sold or is expected to be seen in a short time is produced. The pull system is best known as *just in time* (JIT), in which every stock of material is conceived as a waste. The JIT allows to lighten the production process because it manages to coordinate the time of actual need of material with their acquisition and availability. The method combines elements such as reliability, reduced inventory and lead time, with an increase in quality and customer service. In addition, the reduction in warehouse costs is explicit when each individual wine produced is placed on the platform, the only warehouse available for the supply of goods.
- *Variation in transport costs:* Unlike the classic system where transport is a cost borne by the supplier at each order of the restaurateur, in the new system the cost varies because the platform will be located close to the restaurant chain and the supplier will no longer need to assume the transport costs because assumed by the platform itself. Obviously, if the platform orders a quantity, above a minimum threshold of product, the

cost of transport from the winery or from the shop to the LD would be borne by the supplier, otherwise, remains borne by the platform. Moreover, as the supply of the products has been reduced, the cost of transport is also reduced by it. No more large quantities of bottles will be delivered, but the necessary to supply them. In this respect, please refer to paragraph 5.2.

- *In-Time delivery:* the explicit consequence of the reduction in transport and warehouse costs is certainly that of a delivery in a short time, it will no longer be necessary to consider a lead time or the turnover of stocks much earlier than the hypothetical order request, it will be necessary to short time, even daily, for the replenishment of stocks. As described in paragraph 3.2, the system allows you to have intermediate warehouses in high-density areas of restaurants and therefore there will be no need for extended delivery times.
- *Cancellation of relationships with many suppliers:* the Wine Locker system completely eliminates the relationship between restaurateurs and suppliers, recreating a new one between suppliers and consortium and consortium and restaurateurs. The added value is offered by the fact that the consortium operates a platform, is not a representative, is not a wholesaler, is not a retailer, is a warehouse of stocks always available and much closer to the restaurant. Therefore, the restaurateur can be supplied periodically and with a significantly reduced lead time; the supplier will produce only if requested and will not have any warehouse cost to bear because deposited in the consortium platform. Metaphorically, the restaurant will have a single supplier and the supplier will have a single customer, the Wine Export Consortium.
- *Wide variety of wines:* despite the classic system has this characteristic, the new system will allow to increase the range of wines available because for each region, or desired state, part of the available supply chain, it will be possible to request even a single bottle of that particular territory. Therefore, each restaurateur will have a wider wine list and also the possibility to test more types of wine.

- *Safety:* A problem that often affects restaurateurs is the safety of their products. It is easy that these can be stolen by the same employees. Thanks to the Wine Locker system, the only person in charge is the consortium's employee and it is also easier to maintain control of the products within the WL. The reduction of the possibility of theft is explicit, the only possible case is of breakage of the machinery by force. In addition, the possibility that the restaurant can steal the stock supplied is nothing because if the product is not included in the WL, it follows that there will be no future supply.

3.5 Disadvantages

Innovation certainly has many advantages for both restaurateurs and suppliers, but it is also necessary to specify what are the disadvantages and therefore the changes that can negatively affect the success of the service.

- *"Large" suppliers together with "small" suppliers:* the idea of the consortium unites all the various types of suppliers, whether they are large or small. This situation is certainly to the advantage of small suppliers who have just entered the market or who cover a small area. The small supplier has the possibility, as a consortium member, to obtain all the economic and prestige advantages that large suppliers have. On the contrary, this negatively affects large companies that have no interest in contributing to the success of the small company. The survey showed that large companies would prefer not to join small companies because it would be a fall in reputation for large companies, on the contrary, would prefer to join companies of great importance in order to obtain benefits on a territory belonging to the other company.
- *Customer confidence:* since the market is now considered mature and consolidated, being able to change the behavior and therefore the procurement process of the customer, is not easy. The survey showed that many restaurants would not be willing to change representatives or

introduce new employees they do not trust. Often, many companies tend to steal products or trick the customer. This problem can be overcome as each restaurant will continue to have its own employees in charge of recharging the Wine Locker. Erroneously it could be considered risky, due to possible theft by the restaurant, but by the nature of the Wine Locker the non-entry of the new product will not result in future supply.

- *Increase in the number of partnerships:* even if the system seems to assist towards an optimized system, the number of partners to be considered has increased. In fact, in addition to the simple agreements between suppliers, mentioned in the first point, there are other agreements with express couriers, always available for daily deliveries, with intermediate warehouses, with wine shops, with management teams of locker technology and with local bikers. It is explicit to understand how all these agreements could lead to a number of complications. For example, it would be enough to cancel a wine shop, located in a favourable place for the delivery of the product, to increase the waiting time and therefore also the cost of transport.
- *Reduction of the choice of wine labels:* even if the Wine Locker allows to optimize the internal warehouse of a restaurant, ordering it and reducing the space available, it certainly has the disadvantage of reducing the choice of desired labels. The restaurateur, joining the consortium, will have a limited choice of suppliers, only those who have joined the consortium itself. Even if the restaurateur will have the possibility to replace, for example, a piemontese wine produced by his favorite company with another of equal quality, it may not be gratifying.
- *Difficulties in using the software:* even if the world is now technologically dominated, many restaurants are run by elderly people, or at least staff not always up to date with the technological process. Therefore, you may have difficulty using online payment methods or using the product purchase software itself.
- *Cancellation of discounts:* each supplier after ordering a certain quantity, is used to propose a discount goods or quantity discount. The goods

discount corresponds to a reduction in the purchase price of the packaging, while the quantity discount is nothing more than a promotion on the purchase of a finished number of packaging to get more as a gift. With the new mechanism recreated, the restaurant will no longer enjoy a discount on the product, but the purchase price of the bottle will be equal to or less than the current one, in return the supplier has the certain collection at each withdrawal of product.

3.6 Business Model

In order to facilitate the choice of producers, the survey revealed a number of suppliers, who will therefore be the first to be part of the Wine Export Consortium.

The *Canvas Business Model,* Figure 7, has been used to describe more effectively and simplify, sort and schematize information about the new innovation, highlighting the most relevant elements of the idea.

It consists of nine elements[2]:

- Customer Segments;
- Value Proposition, i.e. the value of the products or services offered for each segment;
- Channels, i.e. the channels through which to reach the customer;
- Customer Relationships, the relationships that are established with the customer;
- Revenue Streams, the revenues generated;
- Key Resources, the company's key resources;
- Key Activities, the key activities to make the business model effective;

[2] Informazioni ottenute da Alvise, 2016, *Business model canvas, the simple diagram for each business model* e Osterwalder, Y. Pigneur (2009). *Create business models*. Milan: FAG, 2012.

- Key Partners, the key partners with whom the company intends to ally in order to create value for the customer;

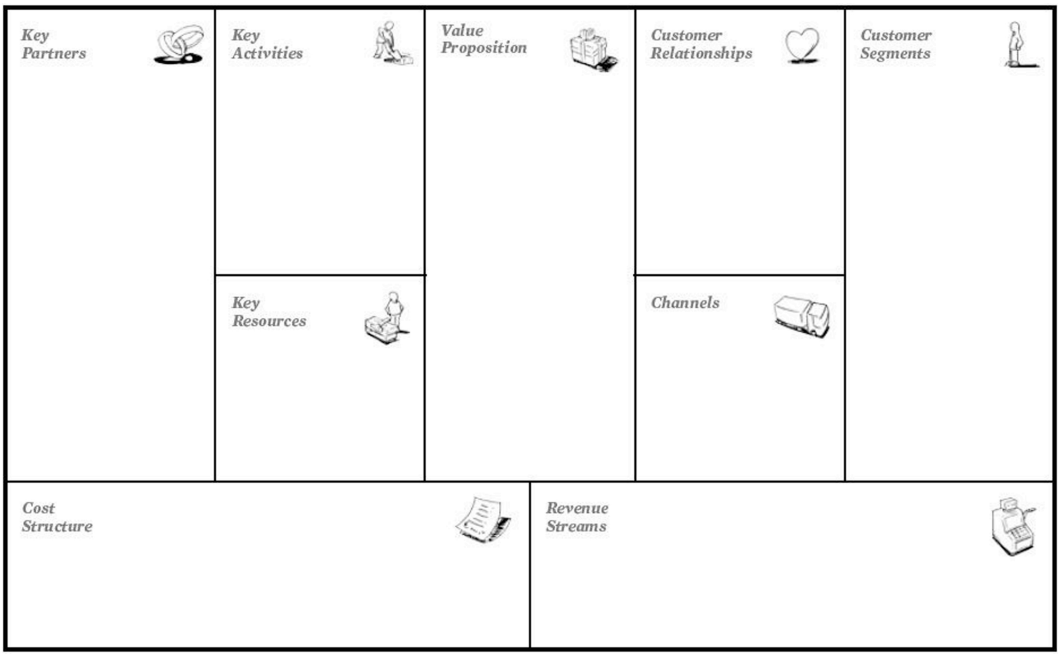

Figura 7. Business Canvas Model

3.6.1 Customer Segments

The first block describes the customer segment to which the value offer is addressed. The main customers are those of the Ho.re.ca system, more precisely restaurateurs and caterers, and in a second evolution also for private customers. Wine producers (wineries) and wine suppliers (wine shops, wholesalers, large-scale retailers, representatives) are also part of the customer segment analysed. Although the subjects of innovation are those listed above, this new idea will re-evaluate some figures to give space to the new protagonist: "Consorzio Wine Export". The new customers will therefore be only the producers who will exhibit and supply the relevant products to the consortium and the restaurants who will interface with the consortium for the supply of the products. Therefore, the producers will become the new suppliers. We will use the two terms as synonyms in the course of our thesis.

Stakeholders will be analysed in detail in section 3.2 below.

3.6.2 Value Proposition

The value proposition represents the added value that innovation offers to the customer, therefore, the reason why a customer should prefer the company over the competition.

A restaurateur should prefer the Wine Locker to the classic wine storage for:

- possibility of having a wide variety of wines;
- delivery in a short time;
- the desire to reduce procurement time;
- decrease in income loss;
- decrease in costs incurred;
- desire to taste extraterritorial wines;
- elimination of refueling;
- reduction of the steps in the procurement process.

A supplier prefers the Wine Locker for:

- possibility of joining a network of member companies to protect and promote your wine cellar: a virtual showcase;
- quick and easy network to reach as many customers as possible;
- desire to reduce the number of intermediaries to be sold, such as wholesalers, large-scale retailers, representatives, wine shops.

The added value is described in detail in section 3.4.

3.6.3 Channels

The distribution channels are essential to inform potential buyers of the new innovation, and are therefore the necessary means for the value proposition to reach customers.

The channel most used by the Wine Locker is the platform of consortium companies. The Wine Export Consortium will take care of the advertising and protection of the labels kept, and will also search for suppliers / producers who will become part of the chain. Once the producers most in demand on the market have been defined, the CWE will search for these producers and take them up on the platform. In this way, each new producer becomes a member of the platform and can take advantage of the benefits attached.

While, for the search of the producers/suppliers by the restaurateurs, it will be necessary a digital channel like a web page, in which the restaurateur can have a virtual showcase of the available products and of those he is looking for. This greatly simplifies the direct relationship between the restaurateur and interface figures, such as representatives. The sale of wine is limited to the web page only.

The web page is managed by a group of developers who take care of managing and creating the associated application that will be used by restaurateurs.

This "app", simple and schematic, presents the list of suppliers of the CWE and the related list of wines desired, restaurateurs can choose the wine they prefer for their Wine Locker and then have their own showcase in their private account.

Each account will show the list of selected wines and their virtual position in the Wine Locker. Once you have chosen the wine to buy, with a simple click on the box of the requested wine, the payment page will appear. After the payment, made with the classic methods, will be shown the screen of actual receipt of the payment and then the possibility to open the locker containing the wine purchased.

Fundamental for the correct development of the Wine Locker, it concerns the transport chain. The Locker Distribution platform will autonomously manage the storage and transport/delivery of goods. This system is the key to the success of innovation. Short delivery times ensure customer support and loyalty.

3.6.4 Customer Relationships

This element describes the relationships that are created between the customer segment and the company. This block, therefore, is concerned with acquiring new customers, retaining them and increasing sales.

To acquire new customers, CWE will find and protect the consortium companies, and thanks to the basic concept behind the consortium, to create the loyalty and collaboration of the parties involved. The consortium, by law, does not create competition between the parties but collaboration and, once it has become a member of the same, gain from the sale of the other partners. As far as restaurateur are concerned, the wine selection page will offer the possibility of choice and therefore the decision on the wine will remain in the hands of the customer, and moreover, it will be the comfort and the added values that the Wine Locker has to determine the loyalty.

In the new business all intermediate figures, such as representatives, wholesalers or large retailers, will be eliminated in favour of the employees of the Wine Export Consortium. The platform will provide the necessary support to the customer-supplier relationship. Moreover, since the WL is a smart vending machine, the ordinary and extraordinary maintenance of the machine will be guaranteed.

3.6.5 Key Resources

Resources represent the stratagic assets that a company must possess in order to launch a new business model.

Since the Wine Locker is a smart vending machine system, special attention must certainly be paid to the IT apparatus that supports the entire system, which for convenience we will define as "Locker Technology" (LT). The Wine Locker collects data on the purchase, reception and withdrawal of goods, as well as information on notification of supply. It is therefore essential to employ management teams that coordinate the reception of information, as well as a

computer team that manages the cloud system integrated into the system, this system will be handled by the Consortium Wine Export. Also important is the marketing team that must provide the image and name of the wine producer joining the platform. A team of express couriers is also essential to handle and deliver the goods quickly, i.e. those who deal with the "Locker Distribution" platform. In addition, in section 5.2 the savings on the cost of transport through the use of green contracts, such as the cargo bike system for last mile logistics, will be assessed.

3.6.6 Key Activities

The key activities are the strategic activities that must be implemented to validate the value proposition and reach customers in the most effective way possible, creating relationships and generating revenues.

Considering the Wine Locker, the activities necessary for its implementation are:

- Development of an e-commerce platform: "Locker Technology";
- Development of a physical platform to act as a warehouse for goods: "Locker Distribution";
- Acquisition and management of partners: "Consorzio Wine Export";
- Wine targeted advertising campaigns in Locker;
- Acquisition and management of express couriers for goods delivery: "Locker Distribution";
- Development and production of Wine Lockers: "Locker Technology".

In order for innovation to be successful, it is necessary to develop an online network that allows restaurateurs to search from the comfort of their homes for the producers they want and the labels that best represent their restaurant. However, in order to implement such a network, it is essential to also create a circle of partners willing to enter the system. The e-commerce network must support the storage platform, which is fundamental for the success of the idea. A platform must be placed in a strategic area and periodically supplied with the

necessary procurement, in this way it will allow customer loyalty and ensure and increase the circle of buyers. It is therefore essential to establish a chain of express couriers, linked to the platform, available for periodic and frequent deliveries of goods, as well as to create the sustainable system of the last mile with the use of bicycles, the part concerning logistics will be discussed in section 3.3. Once the system in which to work has been defined, the production of Wine Lockers is the next step in the implementation of the idea. The production and, therefore, also the agreements with the manufacturing companies, are inevitable for the continuous maintenance and warranty of the machine, offered on loan for use at the restaurant. Obviously the last step is the advertising campaign to raise awareness of the use of the new innovative system, because it involves a revolution in the line of management of the supply of wine and therefore it is essential to bring out the revolution and the improvement in its use.

3.6.7 Key Partners

The chain of partners defines the network of suppliers and partners necessary for the functioning of the business model.

The main strategic alliances will be made with:

- Wine producers
- Express couriers

Wine producers are fundamental for the development of innovation, they are the main suppliers of the platform and it is inevitable to determine with them contracts, and therefore, strategic alliances, important to ensure continuity in supply. Not only that, it is also possible to attach wholesalers and large retailers among the main suppliers of the platform. In addition, the partners themselves must feel involved in the platform, CWE, members and funders. It is therefore essential to create economic and financial benefits for the producers themselves.

The transport companies, which will provide the delivery service, are another important alliance, as well as the network of bikers who will serve the last mile and therefore the most important part of the just-in-time. The logistics network is binding for the waiting lead time. Without closed contracts there is no assurance of possible delay.

The last strategic alliance will be made between the consortium and the possible producer of Wine Locker, called Locker Technology. It will provide the innovative system and manage the attached software system.

3.7 Size of the Wine Locker

To determine the final size of the Wine Locker, several variables were considered:

- Average wine bottle size 0.75 l;
- Number of labels required;
- Number of bottles of the same type;
- Number of bottles sold per day;
- Best selling label of bottles sold;
- Turnover tidying up

Vigilantic.com provides the measurements of a 0.75 l bottle:

- 3 inches (7.6 cm) diameter at the base;
- 29 cm high.

To avoid bottle breakage during insertion and extraction, we will consider 32 cm high and 11 cm in diameter. These values were also considered on the basis of the standard size of a wooden bottle box, which has the dimensions of 35 cm×11 cm×34.5 cm.

The survey showed that each restaurant, on average:

- has 50 wine labels;

- orders a minimum of 10-12 cartons of 6-12 bottles;
- sells 10-12 bottles a day;
- reorders every eight days.

We can, through simple calculations, define the necessary quantity of bottles that a restaurant must have to satisfy the customers' demand.

Since every day it sells 12 bottles and is assumed to reorder every 8 days, the restaurant must have $12 \text{ bottles/day} \times 8 \text{ days} = 96 \text{ bottles}$. Also, considering that it has 50 labels, it should have $50 \text{ labels} \times 8 \text{ days} = 4800 \text{ bottles}$. Intuitively, this number is surreal, because every restaurateur buys in greater quantities only the wine he knows he is selling with certainty, while, of those he sells in smaller quantities, he buys fewer bottles.

The survey showed that of the 50 labels:

- 70% are medium-low quality wines, that is 35 out of 50;
- 20% are low quality wines, that is 10 out of 50;
- 10% are high quality wines, that is 5 out of 50.

In addition, only some of the labels in each category are sold in larger quantities and will represent the future size of the Wine Locker.

The next step is to understand how many labels in the different categories are sold in greater quantities. To determine this data we will base ourselves on the number of bottles sold per day and how these are distributed among the various categories.

Of the 12 bottles sold each day you have that:

- 8 bottles are of medium to low quality;
- 3 bottles are of low quality;
- 1 bottle is high quality.

We will then evaluate each case individually to determine how many bottles must be in the Wine Locker and how many procurements are needed.

1. **Medium-low quality bottles**

The survey showed that 15 out of 35 are from the Piemonte region and are therefore those ordered in greater quantity, our case being limited to the Piemonte region. Of these 15 bottles, however, the 8 most sold are related to 7/15 labels.

Therefore, it would be necessary to $7 \text{ labels} \times 8 \text{ bottles/day} = 56 \text{ wine bottles/day}$ of medium-low quality. Starting from the condition of owning 50 wine labels, the hypothetical basic accessible dimensions of the Locker would be those of a 5×10 rectangle. Even if we assume to increase it to a 6×10, according to the calculations previously made, it would be loaded only with the 7 best-selling labels of medium-low quality. Under these conditions, it is necessary to consider the worst case, in which all 8 bottles sold are of the same label, and the best case, in which, on the contrary, they are all of different labels. From the results obtained it is possible to calculate how many daily supplies to make so that the Wine Locker has all the necessary bottles of the 8 most sold, without however covering the entire available area of our Wine Locker.

Since a constant reorganization of the bottles is foreseen, unlike the current situation, the restaurant will no longer have the problem of the small or large warehouse, the Wine Locker will be the only physical warehouse of the restaurant.

Worst case

The worst case is that in one day the 8 bottles sold are all of one of the 7 types of wine most sold. Because $7 \text{ labels} \times 8 \text{ bottles/day} = 56 \text{ bottles/day}$, the Wine Locker cannot contain all of them, and it is also necessary to leave some compartments for other types of wine between low and high quality. We can consider that of the 8 sold per day, 4 are sold for lunch and 4 for dinner. In order for the Wine Locker to have all 4 bottles, 2 supplies are required, one in the morning and one after lunch. In this way the Wine Locker will have

$7 \text{ labels} \times 4 \text{ bottles/order} = 28 \text{ bottles/order}$ of the best-selling, while the remaining $35 \text{ labels} - 7 \text{ labels} = 28 \text{ labels}$ will be in single copies.

In this case, then, the $20 \text{ bottles} + 20 \text{ bottles} = 56 \text{ bottles}$ will cover a large part of the hypothetical Wine Locker, it is necessary to consider the option of making an extra supply per day.

Let's consider making 2 supplies in the morning and 2 after lunch, for a total of 4 supplies per day. In this case you will need $7 \text{ labels} \times 2 \text{ bottles/order} = 14 \text{ bottles/order}$, as fixed compartments, and 28 of the remaining 35 labels. In conclusion $14 \text{ bottles} + 28 \text{ bottles} = 42 \text{ bottles}$

Best case

The best case, however, requires that in one day the 8 bottles sold are all of different types, so that there are at least 1 bottle for each of the 7 types. In this case, it is easy to understand that regular daily replenishment is not necessary. You will need 35 compartments, one for each type of wine of medium-low quality and only one supply per day.

Calculating an average between the worst and the best case, it turns out that an average of 3 replenishments per day are needed and that at least 2 bottles of each of the 7 copies are needed, for a total of 14 dedicated fixed compartments.

2. **Low quality bottles**

Of the 12 best-selling bottles, only 3 are of low quality and they belong to only 4 of the 10 labels.

Worst case

If the 3 bottles required were all of the same type would be necessary $4 \text{ labels} \times 3 \text{ bottles/day} = 12 \text{ bottles/day}$.

In this case, assuming you sell all the bottles, in one day you can make a single replenishment with the 12 bottles required.

Best case

If the bottles were of different types, exactly 10 compartments would be needed, one for each type. Again, the single daily supply is sufficient to meet demand.

Calculating, in the same way, an average between the worst case and the best case, you get that you need a daily supply and at least 12 compartments dedicated to low quality wine

3. **High quality bottles**

Finally, of the 12 bottles only 1 is of high quality, but of the 5 labels 2 are the most sold.

Worst case

It would be necessary $2\ \text{labels} \times 1\ \text{bottles/day} = 2\ \text{bottles/day}$ of the two best-selling labels. One replenishment a day is enough.

Best case

The Wine Locker has all 5 high quality labels, with daily replenishment of the sold.

Again, one refill per day with at least 2 fixed compartments is sufficient.

In total, therefore, they are essential:

$$14\ bottles + 12\ bottles + 2\ bottles = 28\ bottles\ of\ 12\ labels$$

Therefore, by subtracting from the 50 labels the 12 most requested, you get:

$$50\ labels - (7 + 3 + 2)\ labels = 38\ labels$$

The Wine Locker must have at least:

$$28\ bottles + 38\ bottles = 66\ bottles$$

The Wine Locker must have a size of at least 6×11=66 compartments containing 50 labels. For the structure of the Wine Locker, it is not possible to store two bottles from the same compartment, not even one consecutive to the other. The depth of the Wine Locker is fixed and is equal to a single bottle. Since the most appropriate way to preserve the wine is to store it horizontally, so that the cap is always in contact with the wine inside (vigilantic.com), the depth of our Wine Locker will be 35 cm. While, with regard to height and length, just consider 6 levels of 11 cm each, or 66 cm high and 11 cm×11cm =121 cm long.

Since the WL is also equipped with the BIB section, considering that each 5-litre BIB has a size of 19 cm×14 cm×23 cm (lisottigroup.it and vetrobalsamo.com), in conclusion the size of the WL will be 85 cm×121 cm ×35 cm.

The part intended for the BIB, containing a maximum of 4 bags of 5 liters each, occupies a length of 56 cm of 121, the space advancing could be used for other bottles of wine.

Considering that $121\ \text{cm} - 56\ \text{cm} = 65\ \text{cm}$ by enlarging the BIB compartment by 1 cm you get exactly 66 cm remaining for wine bottles, also since each compartment of the BIB is 19 cm high, enlarging it to 22 cm, you can get 2 rows of 6 columns of wine bottles to add or subtract to the Wine Locker.

Since 66 bottles are sufficient from our calculations, we assume to eliminate 2 columns and insert them on the basis of the Wine Locker, in this way the final size will be:

- 66+22 = *88 cm* high;
- 121-22 (subtracted columns) =99 *cm* long;
- *35 cm* deep.

As far as refuelling is concerned, at least 2 per day is required.

4 STRATEGY

This chapter is devoted to the strategy that needs to be undertaken to bring about the success of innovation. The strategy is nothing more than a long-term plan that will enable the new innovation, at the beginning of its life cycle, to achieve the stability and maturity needed to make it a success. In addition, the final part will be dedicated to the prototype of the innovation, considering the activities carried out and their graphic representation.

4.1 Short and long term optics

The short and long term strategy describes the figure of the consortium related to that of the representative/agent, how it will vary during the life of the innovation and how it will evolve in relation to the restaurateur.

As described in detail in the previous chapter, the representative is who acts on behalf of and in the name of the reference company for which he works. His figure, at this moment, is the source of the success of a company, since it is he who defines the future relationship and bond between the company and the restaurant. The representative is the promoter, seller and accountant of the wine in question. They hardly have single-firm contracts, in fact, they often represent between 3 and 5 companies. For a representative it is essential not to be tied to a single company because a restaurant often prefers to have a varied wine list from different regions. From this point of view, it is clear that the representative also plays a key role in the success of our innovation because he is the one who enters into a relationship with the customer. Since, however, the innovation developed does not provide for the presence of many intermediaries in order to limit the wine supply process of the restaurateur, it is possible to develop two different approaches: a short term and a long term one.

- Short-term optics

The strategy to be adopted in the short term involves the inclusion of existing representatives on the market in the Wine Export Consortium, these will continue to advertise and create contracts with restaurants, but will also work on behalf of the consortium. They can choose to continue working for previous companies but with the constraint of becoming part of the rules of the consortium and advertise the Wine Locker. Since it is difficult to induce all companies to join the consortium, in the short term it is also expected the presence of some representatives within the consortium who will instead include new members and then focus on new markets, new restaurants, new partners.

It is essential to initially maintain existing representatives as a key figure in the new system, being a new product inserted in an existing market, maintaining the loyalty of existing customers is the key to the success of the innovation. Considering the customers present and trying to introduce them into the new system is the most feasible choice in the short term. The problem of trust between the customer and the supplier has always been the factor of failure of a system, you must create, but, above all, maintain loyalty to ensure customers.

- Long-term optics

The long-term strategy, on the other hand, is to eliminate the figure of the external representative of the consortium, and therefore consider only internal representatives who will manage relations with the old and new restaurants. The figure of the representative is preserved but changes the relationship with the supplier, there will be no more direct relations between the representative and the producer company, the representative will be the spokesperson for all members of the consortium, will advertise all categories and labels of wine, will no longer be bound by multi-firm or

single-firm contracts, will continue to have the appearance of a representative but will acquire new form.

4.2 UML - Activity Diagram and Prototype

A simplified way to better understand the movement of the stock is possible with the use of UML. Below will be depicted and explained a series of activity diagrams that best summarize the steps and figures that come into play in the various stages of development of the service, each accompanied by a prototype.

- Supply Activity Diagram

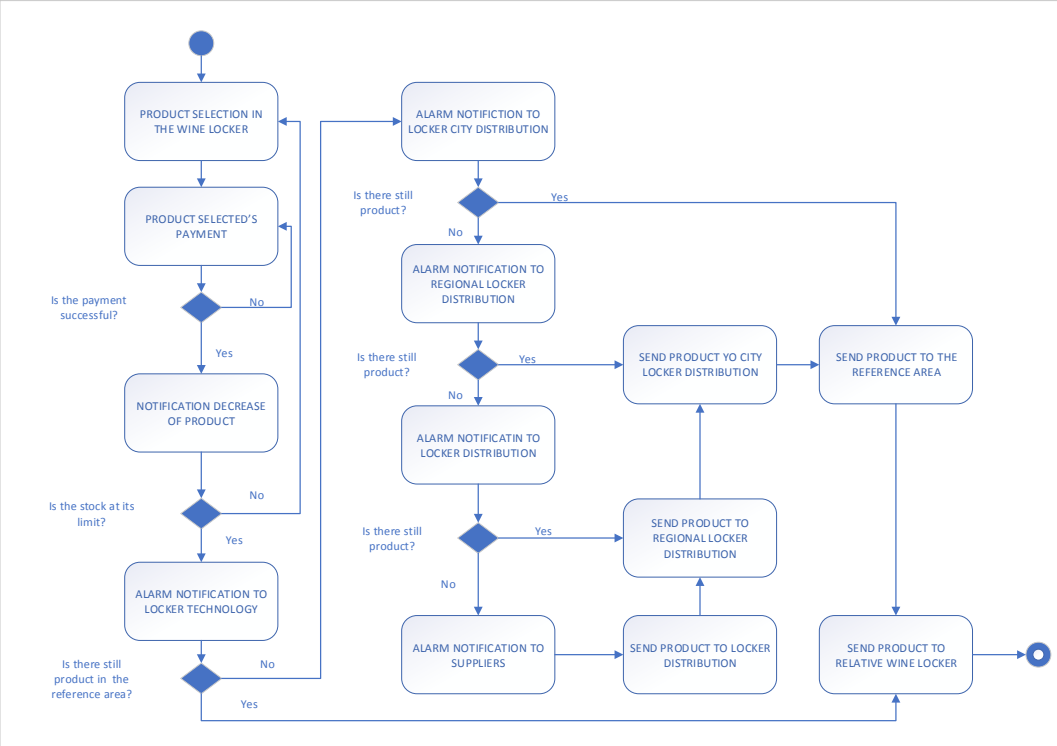

Figure 8. Procurement process

Figure 8 shows the process of supplying products to the WL. Once the request has been received from the customer in the restaurant, the person in charge of picking

the product, through the application, selects the desired product. Afterwards the application shows the payment interface and, only in case of successful payment, you can open and pick up the product from the compartment. Each time the product is successfully picked, the Wine Locker sends a notification to the Locker Technology which checks the stocks in the Wine Locker, if the products present are still sufficient to meet the average demand of that restaurant, the reduction in stock is only collected without being notified to the area (wine shop) of reference. When the Wine Locker signals that a certain product has reached its limit value, the Locker Technology promptly notifies the reference area of the necessary supply, which sends the desired product. When the reference area reaches the limit value for a given product, it sends a notification alert to Locker City Distribution, which in turn sends the required products to the reference area. When the Locker City Distribution also reaches the limit value for a given product, it notifies the Locker Regional Distribution that it sends the requested products to the Locker City Distribution. The process continues in the same process until it is notified to the suppliers themselves.

- Purchase product by the restaurateur

Figure 9 represents the activities that the restaurateur must carry out in order to purchase a product from the Wine Locker. Once the application is opened, your account will show all the products in your Wine Locker, with stocks and costs. Once the desired product has been selected, the application will show the payment screen, only when the payment has been made will the compartment of the desired product open with the possibility of withdrawing the product. Figures 9.1 and Figure 9.2 show the interface that would appear when the application is opened. Figure 9.1 shows the selection of the product "Nebbiolo", in green, with the appearance of the purchase price, while the products in red represent the stock deficit. Figure 9.2 shows the payment interface. Figure 9.3 instead shows the image of the Wine Locker with the reduction of the product, now in red.

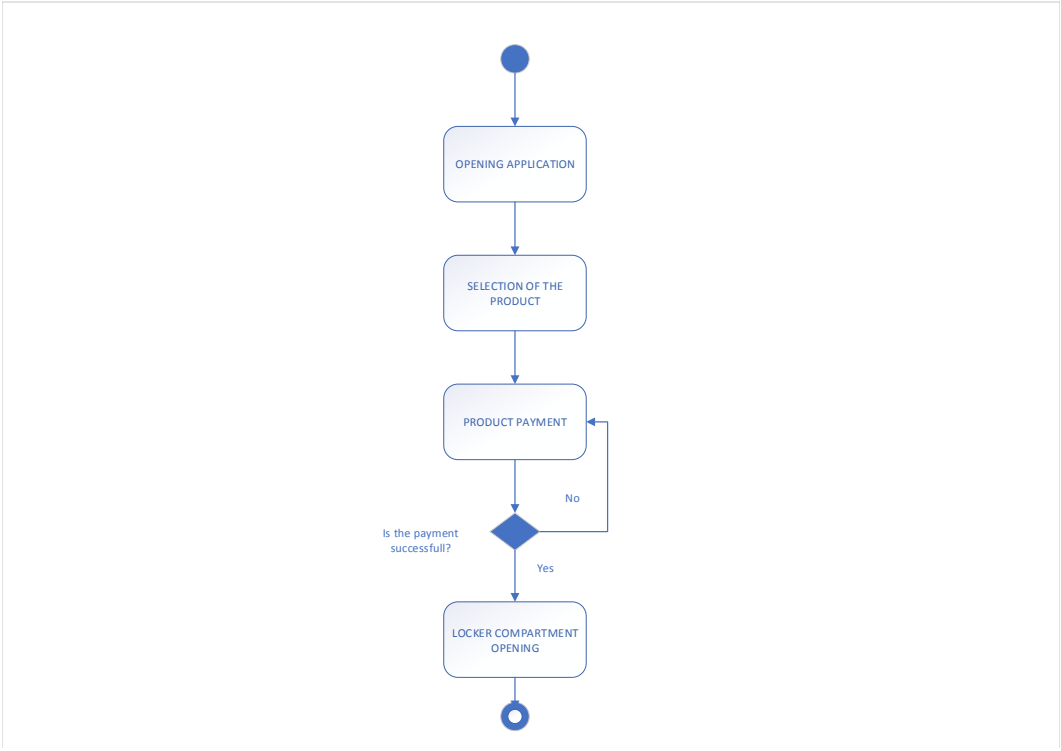

Figure 9. Client's request product

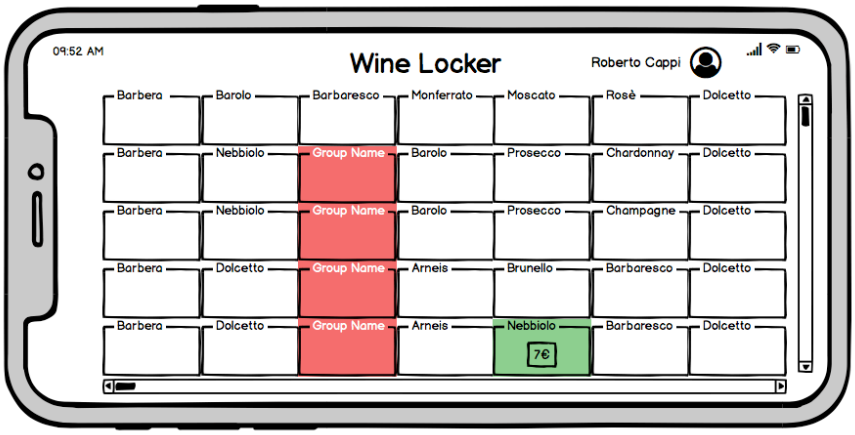

Figure 9. 1 Wine Locker Interface

Figure 9. 2 Payment Interface

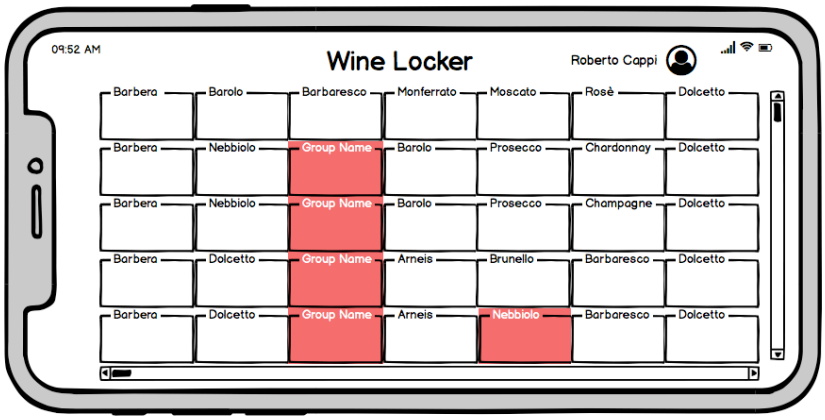

Figure 9. 3 Interface Wine Locker after payment

- Product selection from website

Figure 10 finally represents the activities that the restaurateur must do in order to select their products in the Wine Locker. Once the website has been opened, the restaurateur will have the opportunity to choose whether to search by suppliers or by label, after which the complementary choice and the definition of the quantities to be included in their Wine Locker will be presented. Figure 9.1 represents the prototype of the interface of the web page dedicated to the choice of labels to be inserted in the Wine Locker. The example shows the selection of the category "Label" and the label "Barbera". Following the selection, a second table will appear with all the types of Barbara present, accompanied by the age, the supplier and its possible availability. You can also define the number of copies you want (top right). Added to the purchase, located at the top right, the Wine Locker, Figure 9.2, will show the filling of the compartments, in blue, and the remaining in white yet to be filled.

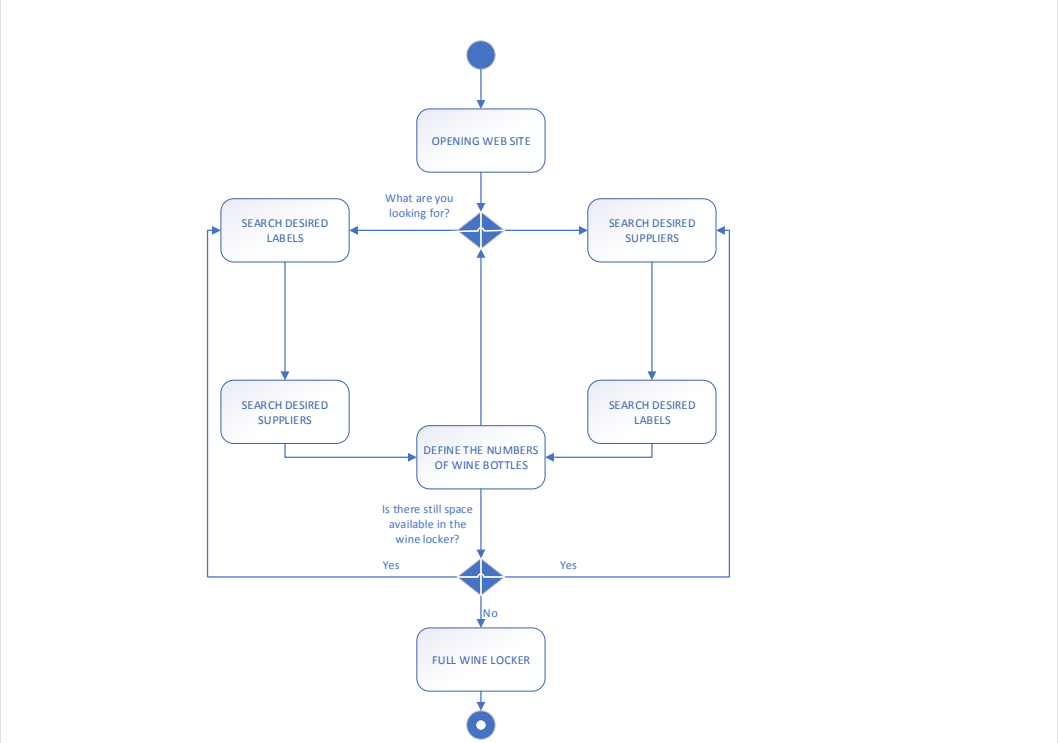

Figura 10. Search on the web page

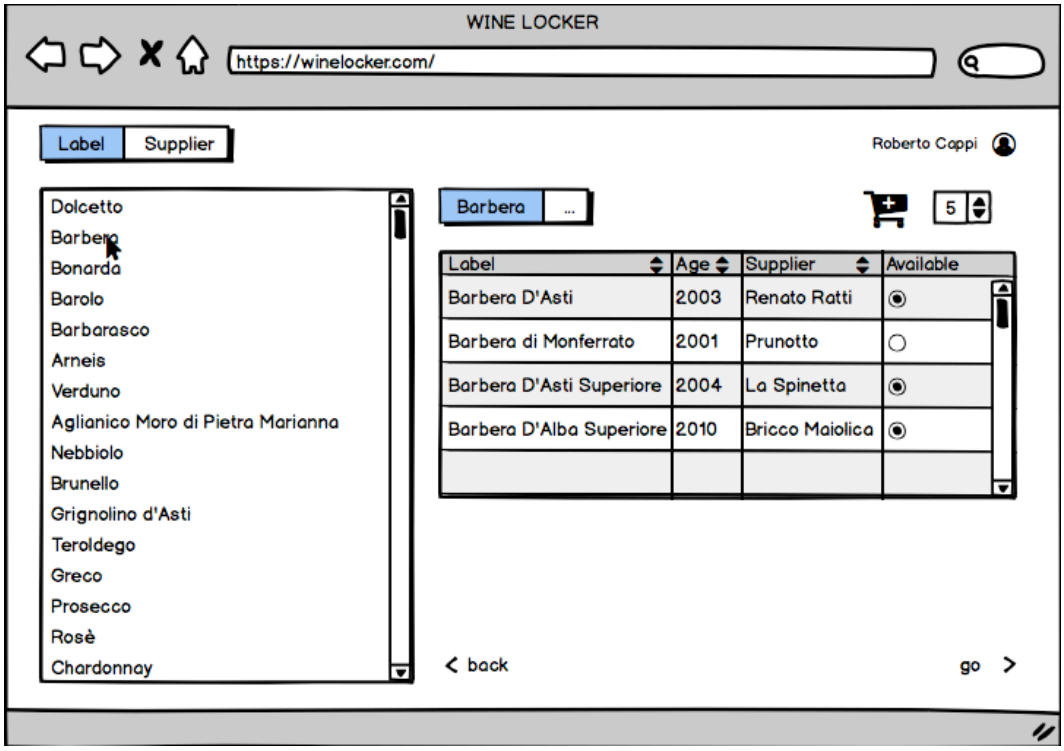

Figure 10.1 Interface Website

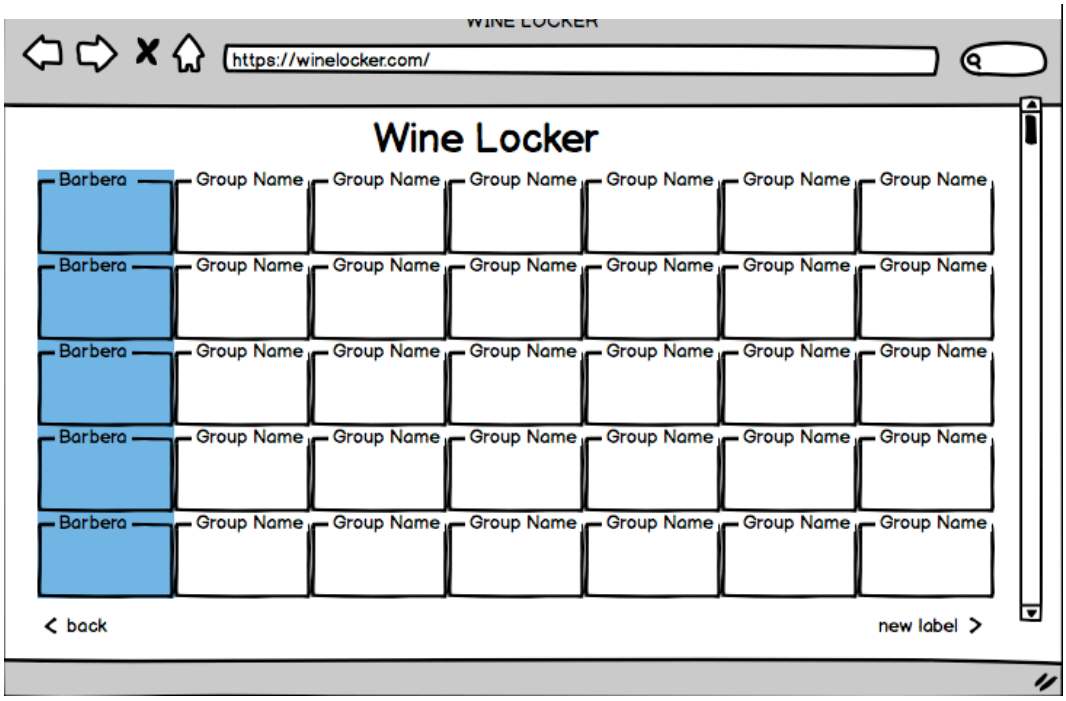

Figure 10.2 Interface Wine Locker Website

4.3 Future strategy: RFID system

Although the system operates efficiently, one could think of defining some elements that could improve and optimize the service. For example, to reduce the actions of the restaurateur, the Wine Locker could be thought of as a completely open structure, in other words, take the form of a wine exhibitor. In this case it would be easier for the restaurateur to view the product and pick it up in absolute comfort. Although the idea of an exhibitor can be advantageous to the restaurateur, a new data collection system must be considered and therefore possible theft of the product avoided. For this purpose, the Wine Locker must be equipped with an RFID (Radio Frequency IDentification) system. The technology allows to store and/or identify in an automatic way information about objects thanks to the use of particular electronic labels, called tags, which allow to identify an object in a certain radius thanks to the use of particular readers. These identifications are made by radio frequency, the reader has the ability to communicate with the tag and to update the information he is interrogating. The reader is therefore able to both read and write the information it interrogates. These writing and reading systems can be fixed or portable, but in both cases, they are considered wireless systems with several associated applications. RFID systems allow you to keep under control all objects, people or animals in possession of electronic tags, and then also take into account all the goods leaving the warehouse. In our case, the RFID system will take into account all the bottles that come out and enter the Wine Locker. The RFID label allows you to uniquely identify each unit, even if it is the same product, the system will identify it with its own label. To keep under control any product coming out of the Wine Locker, the system propagates electro-magnetic waves in the surrounding space that allows to detect moving or static objects.

Each label consists of a tag or transponder that represents the identification part of the object, in other words it is assigned a radio impulse. Each pulse allows a different frequency reading to be defined. The reader is characterized by an antenna, which, once activated, generates an electro-magnetic pulse that in turn

activates the labels. Obviously, each label is placed in such a way that the interferences that are created do not have a negative effect on the reading and exchange of information. With this tool you can easily evaluate how many products have left the warehouse and at the same time how many are entering, just read the labels of each product. In addition, compared to the classic barcode in which the product must be visible to the reader to be scanned, the radio waves of the RFID system pass through all the materials so as to be easily traceable.

In other words, the Wine Locker will take on the appearance of an exhibitor and every time the customer requests a particular bottle of wine it will be taken from the structure, paid for through the system and read as an exit from the Wine Locker. Even if the reading were not made, within a certain range, thanks to the waves emitted by the label and read by the reader, the product would be out of the Wine Locker and automatically charged to the restaurateur. In the same way, if the new product enters the structure, the reader detects the new label and registers a new product in the Wine Locker. This system allows to overcome the problem related to the vision of the bottle by the customer, infact, the control of outgoing bottles is calibrated on 20 minutes before the actual charge, while the time of entry is calibrated on the millisecond.

The system thus becomes more efficient, because human intervention is not required, flexible, since the optical range of the labeled object is not necessary, and robust, because the tag can hardly be damaged.

The same system will be used in intermediate warehouses to facilitate data collection.

It is also important to specify that the information obtained in the drafting of the thesis concerns a survey conducted on a limited number of restaurants, in order for the service to be efficient, it is necessary to expand the sample considered and consequently allow each restaurant to have, for example, a larger Wine Locker, containing 360 seats. (standard model of amazon's Locker, amazon.it).

5 ECONOMICS & FINANCIALS

5.1 Warehouse savings

The Wine Locker, compared to the classic product storage, allows to obtain a saving of space in the warehouse and consequently also of the related costs associated with it.

To evaluate the savings, we will assume, on the basis of the survey data, an average of the bottles owned by a warehouse and we will evaluate the space occupied by them in comparison with the space used by the new innovation.

It is explicit how the simple storage of a small quantity of bottles leads to a reduction in the area occupied by them. In this paragraph we will define the cost savings.

To determine the savings we will use:

- Area of a box of 6 bottles;
- Minimum cost of a box of bottles of wine;
- Cost of purchasing a bottle of low, medium, high quality;
- Area of the Wine Locker;
- Average rental price of a warehouse in Turin;
- Correct handling space.

To calculate the area occupied by a package of 6 bottles, let's consider the size of a single bottle of wine of 0.75 ml, for this analysis were used the size determined by vigilantic.com:

- 3 inches (7.6 cm) diameter at the base;
- 29 cm high.

Therefore, considering the space for inserting and removing the bottles, the final size of a pack of 6 bottles is 25 cm×16 cm×30 cm.

The next step is to determine how many bottles on average a restaurant's wine cellar has. Considering that the minimum cost of an order and comparing it to the various selling prices of the various bottles, according to the category of appearance, it is possible to calculate how many bottles, on average, are in stock. The value varies between 250 and 600 bottles per restaurant. I did:

- Low quality bottles

  Considering for example a minimum cost of 500 € and since these are normally ordered in quantities of 12 bottles at a purchase price of 3.5 €/bottle you have that:

  Average number of bottles low quality:

$$\frac{€500}{3{,}5€/bottles} = 143\ bottles$$

- Medium quality bottles

  Applying the same reasoning, however, considering a purchase price of 8€/bottle:

  Average number of bottles medium quality:

$$\frac{500\ €}{0\ €/bottles} = 63\ bottles$$

- High quality bottles

Applying the same reasoning, however, considering a purchase price of 12€/bottle:

Average number of bottles medium quality:

$$\frac{500\ €}{12\ €/bottles} = 42\ bottles$$

For example, if you add up these quantities, you get 250 bottles.

According to the minimum cost considered and the price of the bottles, the final value changes. For the size of the restaurants considered and for an effective explanation, 600 bottles will be considered in the analysis.

In addition, we will assume that each box is placed on a shelf of 4 shelves and that each level contains 3 packs, each shelf will contain 18 bottles. This criterion was chosen both for efficiency in the manual handling of loads and, therefore, insertion and extraction of the packs, without reaching excessive heights, and for weight, to avoid overloading the shelves.

Each bottle has a weight of about 1.32 kg[3], so a pack of 6 bottles will have a total weight of 7.8 kg. Each shelf will therefore have a maximum weight of 23.4 kg.

Each shelf can then contain 12 packs of 6 bottles each and then 72 bottles. Since the total number of bottles is 600, 9 shelves will be needed.

From the size of a pack of wine bottles we can determine the length and width of our shelf.

The dimensions of a shelf will be 120 cm× 50 cm× 30 cm.

Area occupied by a shelf:

$$0{,}50\ m \times 0{,}30\ m = 0{,}15\ m^2$$

Area occupied by 9 shelves:

$$0{,}15\ m^2 \times 9 = 1{,}35\ m^2$$

To this must be added the space for the movement of personnel and tools, for example, for a trasport trolley of 80 cm, you need a space of at least 1 meter between the various shelves. Assuming you have them in two rows, one of 4 and one of 5:

---

[3] http://www.vigilantic.com

Length of 5 shelves:

$$5 \times 0{,}50\ m = 2{,}5\ m$$

Overall area:

$$1{,}35\ m^2 + (2{,}5\ m \times 1\ m) = 4\ m^2$$

According to the real estate quotation bank of the Minister of Economy and Finance, the average rental price of a room (in excellent condition) in the city centre (zone code B2) in Turin is 28.8 €/m^2 per month.

Total cost of warehouse:

$$4\ m^2 \times 28{,}8\ \frac{€}{m^2 month} = 115{,}2\ €/month$$

Total annual cost of warehouse:

$$115{,}2 \frac{€}{month} \times 12\ months/year = 1382{,}4\ €/year$$

- Wine Locker Area

  As described in the section on the dimensions of the Locker, its final dimensions are: 88 cm × 99 cm × 35 cm. Because it is represented by a rectangle as the base area:

  Area Wine Locker:

  $$99\ cm \times 35\ cm = 3465\ cm^2 = 0{,}3465\ m^2$$

  In this case, however, the only area that should be added is that which refers to the correct movement of a person, it takes 70-80 cm. Therefore:

Total area Locker:

$$0{,}3465\ m^2 - (0.80\ m \times 0.99\ m) = 1{,}1\ m^2$$

Total cost of warehouse:

$$1\ m^2 \times 28{,}0\ \frac{€}{m^2\ month} = 31{,}93\ €/month$$

The saving is therefore of:

Saving per month:

$$115{,}5\ €/month - 31{,}93\ €/month = 83\ €/month$$

Savings on warehouse costs per year:

$$31{,}93\ €/month \times 12\ months/year = 383{,}16\ €/year$$

% Savings on warehouse cost :

$$\frac{115{,}2€ - 31{,}93€}{115{,}2€} = 72\%$$

5.2 Savings in last mile transport

In this section we will calculate the saving of the transport cost and the advantage of the Just in Time offer. The system must use an efficient logistics network to achieve rapid delivery. Since innovation requires delivery within one hour and in order to avoid an excessive increase in the level of CO_2 due to the use of express couriers, the most appropriate system is that of green contracts.

Environmental sustainability is a problem that affects all societies and trying to reduce environmental impact is one of the primary objectives.

As widely discussed in previous chapters, the Wine Locker's logistics network consists of many steps, from the largest Locker Distribution to the area ones in the city districts. To evaluate the transport costs, in this paragraph, the cost of the last mile of the Wine Locker is compared with the traditional transport costs used in the current system.

Initially it will be considered the cost of transport concerns the new innovation.

With the new system it is essential to have express couriers always available during the work shift, even for the simple transport of a single bottle of wine. Considering the costs of outsourcing the service to a transport company, used for larger warehouses, the last mile is not very profitable. The sustainable system developed concerns the possible use of green systems, such as bicycles. This service is still offered by food delivery systems (*Foodora, Glovo, Delivero*), taken as a reference in our analysis. In addition to avoiding traffic problems, green services allow you to make many more deliveries than the classic model.

The process is simple, anyone can work as a delivery-bottles of wine for the CWE. All you have to do is log in via the website and follow the steps related to the application; the only requirement, in addition to the age of majority, is to have a bicycle. The available shifts correspond to the lunch service (11:00 - 15:00) and the dinner service (17:00 - 00:00). Every Tuesday of the week you can, via website or app, select the desired shifts for the week. The price is 3,60€/delivery. Once you have defined the shifts, the system will establish your work area, then a wine shop, and will show you the restaurants to serve with their distances. Each wine shop will serve a maximum of 4 restaurants, and each biker will serve a unique restaurant. At the beginning of the shift the system will show the restaurant with its deficit of bottles, then it is up to the biker to deliver the quantity in default to the restaurant employee. Each time the Wine Locker is in deficit, the biker in charge will be notified with the number of bottles missing and the restaurant to serve.

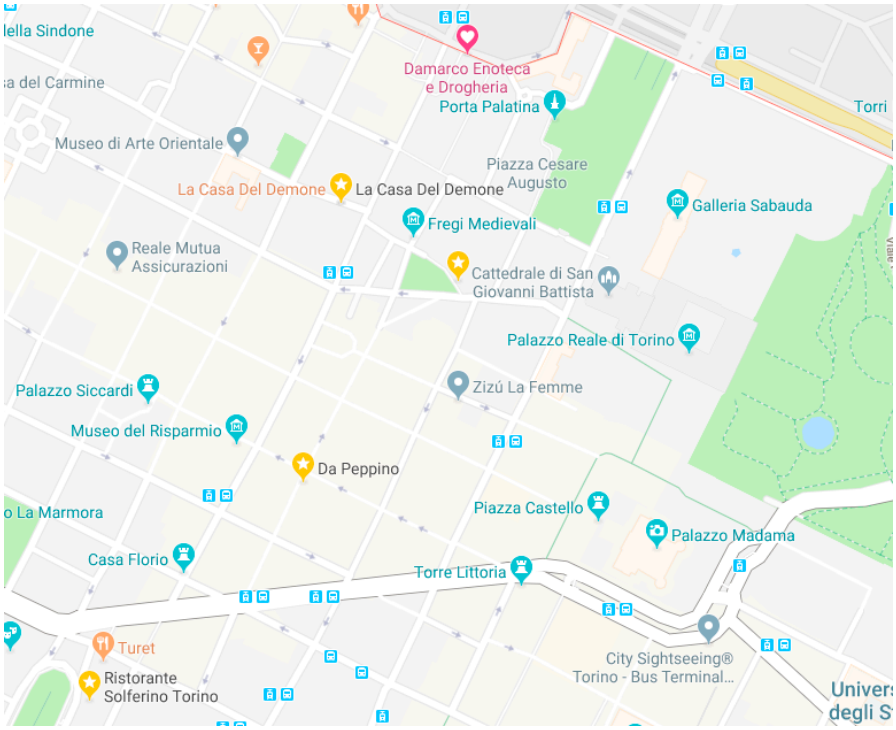

Figure 11. Map restaurant and wine bar

In order to determine the advantage of this innovation, 4 restaurants and a wine shop will be considered and the travel and delivery times of the requested product will be calculated.

The analysis is based on the city of Turin, in particular, Figure 10, the center area and its selected restaurants (cursor with the star) and the wine shop (cursor with the heart) that serves them:

- Wine shop: Demarco Wine shop and grocery store
- Restaurant 1: Casa Del Demone;
- Restaurant 2: Da Peppino;
- Restaurant 3: Restaurant Solferino;
- Restaurant 4: Casa Broglia.

For each restaurant the distance from the wine shop to the restaurant has been considered:

- Restaurant 1: 4 minutes;
- Restaurant 2: 10 minutes;
- Restaurant 3: 12 minutes;
- Restaurant 4: 6 minutes.

In addition to the journey time, from the place of origin to the place of destination and vice versa, the time for delivery of the product must be added, which is considered constant and equal to 2 minutes.

The final times are therefore of:

- Restaurant 1: 12 minutes;
- Restaurant 2 : 24 minutes;
- Restaurant 3: 28 minutes;
- Restaurant 4: 16 minutes.

The next step is to understand how many bottles each biker is able to carry to meet the initial demand. Since the weight of a single 0.75 ml bottle is 1.3 kg (winefolly.com), and since the average demand for each restaurant is 12 bottles/day. The total weight is 15.6 kg.

The basic dimensions of the transport (amazon.it) backpack are 35 cm × 37 cm × 41 cm, the volume is 53 dm^3, since the volume occupied by a bottle is 1,36 dm^3, the backpack can contain up to 38 bottles, with a total weight of 50 kg. This value is certainly excessive considering the fragility of the object transported and the unreliability of the medium.

Considering that we can fix the transport backpack to the bike, we assume that the 12 bottles are served 6 at lunch and 6 at dinner, so only 6 bottles with a total weight of 7.8 kg are needed for each shift.

Also, considering that the goal is to minimize deliveries, we can have 4 bikers, each of them runs a restaurant.

Cost per biker:

$$3{,}60\,\frac{€}{delivery} \times 1\,\frac{delivery}{day} = 3{,}60\ €/delivery$$

Cost per month per biker:

$$3{,}60\,\frac{€}{delivery} \times 30\ days/month = 108\ €/month$$

Cost per month for 8 bikers:

$$100\,\frac{€}{month} \times 0\ bikers = 864\ €/month$$

Annual cost for 8 bikers:

$$064\,\frac{€}{month} \times 12\ \frac{months}{year} = 10368€/year$$

This is the certain cost that every biker would have with only one delivery per day, but by nature of the Wine Locker, every biker could make other deliveries in the day to the same restaurants. Considering the first 5-hour shift, we check how many deliveries each biker can still make, eliminating the first delivery of 6 bottles.

- Restaurant 1: 12 minutes

Time remaining after first delivery:

$$300\ \text{min} - 12\ min = 288\ min$$

Deliveries still possible:

$$\frac{288\ min}{12\ min} = 24$$

- Restaurant 2: 24 minutes

Time remaining after first delivery:

$$300\ min - 24\ min = 276\ min$$

Deliveries still possible:

$$\frac{276\ min}{24\ min} = 11$$

- Restaurant 3: 28 minutes

Time remaining after first delivery:

$$300\ min - 20\ min = 272\ min$$

Deliveries still possible:

$$\frac{272\ min}{28\ min} = 9$$

- Restaurant 4: 16 minutes

Time remaining after first delivery:

$$300\ min - 16\ min = 204\ min$$

Deliveries still possible:

$$\frac{284\ min}{16\ min} = 17$$

To assess, however, the cost of transport today, considering the same demand for 12 bottles / day. To simplify the calculations, only the volume of the best-selling labels is considered. Since 35 medium-low quality labels represent the highest

percentage of the 50 labels and 7 of the 35 are the most sold, the latter will be the protagonists of future calculations.

The sales volumes of the 7 best-selling labels are on average[4]:

- Arneis, Dolcetto, Barbera: 54%;
- Nebbiolo, Bonarda: 31%;
- Barolo, Barbaresca: 15%.

Having a question of 12 bottles/day, you should own it:

Number of bottles per month:

$$12\frac{bottles}{day} \times 30\frac{days}{month} \times 7\,\text{labels} = 2520\,bottles/month$$

This volume of bottles should be weighed against sales volumes:

- 54% of 2520 bottles/month = 1361bottles/month;
- 31% of 2520 bottles/month = 781 bottles/month;
- 15% of 2520 bottles/month=378 bottles/month.

To ensure the sales of the bottles ordered, each restaurant restores every 7 days, in other words, 4 in a month.

- $\frac{1361\,bottles/months}{4\,orders/months} = 340\,bottles/order$;
- $\frac{781\,bottles/months}{4\,orders/months} = 195\,\text{bottles/order}$;
- $\frac{378\,bottles/months}{4\,orders/months} = 94\,bottles/order$.

Since the cost of transport is 2,50 €/package[5], you have:

[4] Data extracted from the analyses carried out by Mediobanca: http://www.inumeridelvino.it/2017

[5] Guido Perboli, Maringela Rosano, *Parcel delivery in urban areas: Opportunities and threats for the mix of*

Number of packs of 6 bottles:

$$340\,\frac{bottles}{order} + 195\,\frac{bottles}{order} + 94\,\frac{\text{bottles}}{\text{order}} = 629\ bottles/order$$

$$\frac{629\ bottles/order}{6\ bottles/parcel} = 104\ parcels/order$$

Cost of transport to order:

$$104\ \frac{parcels}{order} \times 2{,}50\,\frac{€}{parcel} = 260\ €/order$$

Monthly transport cost:

$$260\ \frac{€}{order} \times 4\ orders/month = 1040\ €/month$$

Annual trasport cost:

$$1040\ \frac{€}{month} \times 12\ months/year = 12480\ €/year$$

Monthly saving on transport costs:

$$1040\ € - \ 864\ € \ = 176€$$

% Saving on transport costs:

$$\frac{1040€ - 864€}{1040€} = 17\%$$

The calculated savings should be further reduced by the cost of transport from Loker Distribution to the individual areas, even this cost is lower than the current one, considering that, are transported each time a smaller amount of bottles, and therefore packaging, one way.

CONCLUSION

The thesis presented is the complete development of a Wine Locker, starting from its business model, based on what are the advantages and disadvantages of the idea, ending with some of the most significant costs in the development of the model.

Savings and the tedious procurement process are overcome with the new business model. The Wine Locker is advantageous for both suppliers and restaurateurs who would not only save on costs, but would also gain a significant advantage from the point of view of product delivery. JIT is now widespread in part of the processes and is advantageous in obtaining a product in the short term and on inventory management. At the same time, however, it would be necessary to evaluate all other costs and then verify that the economic and financial forecasts are positive, such as the investment in the construction of the Wine Locker, the cost of the various intermediate warehouses, and the percentages to be distributed to each shake from the purchase of a single bottle.

The system is convincing and profitable compared to the two costs mentioned above, and therefore useful to the restaurateur for the development of his business. However, each figure corresponds to a survey of a limited number of restaurants, so in order to obtain more truthful data, the statistics should be extended to a larger number of future customers.

Moreover, the model, being new and innovative, needs a program of sensitization to the use, in order to induce a clientele, now mature, towards a new vision of the supply system.

Moreover, in this thesis only the B2B model has been evaluated, but it can be extended, in the same way, to the B2C model, or even revolutionize it by adding a

food deposit system to the Wine Locker, it would be enough to refrigerate the Wine Locker and add new compartments.

INDEX OF FIGURES

TABLE INDEX

ATTACHMENTS

- Annex 1: Restaurant survey

	SEATS	LABELS	LABELS TYPES			BOTTLES SOLD/DAYS			BEST SELLING LABELS			PAYMENT TYPES			
			alta	media	bassa	alta	media	bassa	alta	media	bassa	30 gg	60 gg	90 gg	alla consegna
RESTAURANT 1	50	30	10,00%	70,00%	20,00%	0	6	2	0	8	4	no	si	no	no
RESTAURANT 2	70	45	10,00%	80,00%	10,00%	1	6	2	2	6	3	no	no	si	no
RESTAURANT 3	90	48	15,00%	60,00%	15,00%	1	7	2	2	7	4	no	si	no	no
RESTAURANT 4	100	49	14,00%	80,00%	60,00%	1	8	2	2	8	4	no	si	no	no
RESTAURANT 5	120	56	9,00%	70,00%	10,00%	1	7	4	1	8	4	no	si	no	no
RESTAURANT 6	130	67	7,00%	80,00%	13,00%	2	9	1	3	7	5	no	si	no	no
RESTAURANT 7	60	40	10,00%	70,00%	20,00%	0	7	2	0	6	3	no	no	si	no
RESTAURANT 8	80	50	7,00%	50,00%	33,00%	1	7	2	2	7	4	no	no	si	no
RESTAURANT 9	90	50	9,00%	80,00%	11,00%	1	7	1	2	8	3	no	si	no	no
RESTAURANT 10	100	64	10,00%	70,00%	10,00%	1	8	1	2	7	3	no	si	no	no
RESTAURANT 11	200	70	9,00%	80,00%	22,00%	3	8	3	3	8	4	no	si	no	no
RESTAURANT 12	130	67	15,00%	70,00%	15,00%	1	8	3	2	7	5	no	si	no	no
RESTAURANT 13	40	20	10,00%	60,00%	30,00%	0	7	2	0	5	3	no	si	no	no
RESTAURANT 14	70	45	7,00%	60,00%	22,00%	1	9	2	2	7	2	no	si	no	no
RESTAURANT 15	90	50	12,00%	70,00%	18,00%	1	9	2	2	7	3	no	no	si	no
RESTAURANT 16	140	50	20,00%	60,00%	30,00%	3	9	3	2	7	3	no	si	no	no
RESTAURANT 17	160	52	12,00%	70,00%	17,00%	2	8	3	2	8	3	no	no	si	no
RESTAURANT 18	100	50	10,00%	60,00%	22,00%	1	7	6	2	7	4	no	no	si	no
AVERAGE	108	52	10,50%	67,86%	19,50%	1	8	3	2	7	4	0%	61%	33%	0%
NUMBER LABELS/CATEGORIES			5	35	10										

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