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Introduction

My stage regards the period lasted six months spent in the PSA Groupe Peugeot Citroën, especially in the “After Sales Department”. During the six months spent in the centre of “Via Gallarate”, I had the opportunity to study and fully understand the whole sales and spare parts distribution processes.

My thesis is divided into six chapters that summarize almost every aspect of the work done during the internship, from the general presentation of the company to the description of the analyses carried out.

The first chapter gives a general overview of “PSA”, and a description of the “After Sales Department”.

In the second chapter I present the new idea, the new strategy that “PSA Groupe” has implemented in order to increase spare parts distribution performances.

The third chapter describes the scenario in which I operate and in particular my role within the company.

In the fourth chapter are reported most of the analysis I followed during these months, especially the new ones I introduced.

The fifth chapter shows some reasoning and idea that can be implemented in a hypothetic future in order to increase performances of the company.

Finally, in the sixth and last chapter I explain final consideration and why this internship has been useful for me.

1. The Company

This chapter wants to describe the evolution of the company from its origins. It is also reported the position of the group within the market and finally it gives a general presentation of the “After Sales” and spare parts distribution in order to understand the department in which I work.

“PSA Groupe” was founded in 1976 thanks to the merger between “Citroën” and “Peugeot”. During 2014, “DS” became officially the third group logo. Moreover, an agreement between “Donfeng Motor Group”, a Chinese manufacturing company, and the company was signed for the sale of a portion of the company's shares of around 14%. After a serious economic crisis Carlos Tavares became the CEO of the group. He did commercial agreements with “General Motors”, “BMW” and “China Changan Automotive” for the Chinese share. Thanks to these and efficient strategic plans like the “Back in the race”, the company was able to get out from this crisis.

“PSA” is the second largest car maker in Europe covering the 20% of the market share, producing in 2014, mostly in Europe, more than 2 million vehicles, and selling in 2015 almost 3 million of cars all over the world with a turnover of around 53 billion euros. During 2018 also “Opel” is going to enter the “Groupe”.

As said before, I’ve been included as analyst in the “After Sales Department”. Once a vehicle is sold to a customer, every operation needed on that vehicle, like for example the inspection or the change of the brake pads, regards the “After Sales”. This department deals with the sales and the management of the supply of spare parts. The director of this department is my company tutor “Alessandro La Torre” who manage lots of people among which the “Zone Managers”. It’s important to underline the presence of these people because they are object of some of my analysis.

2.PSA new strategy – the hubs

The Chapter has the task of explain how spare parts are distributed from the warehouses to the repairers thanks to the new distribution strategy adopted by “PSA” during 2017. It shows firstly the difference between today's situation and the previous one and finally reports pros and cons of the new one.

Before 2017 there were 249 small distributor placed everywhere in Italy, that, often, were also repairers. The new strategy provides for the closure of these and for the creation of big official distributors, the so-called “hubs”. These hubs are very big warehouses that the company has sold to private lenders who manage them. They are fourteen and scattered around Italy.

The hubs are supplied by “PSA” and serve the repairers placed in the area of their competence.

This new strategy is really advantages for many reasons:

- Lower logistic costs: thanks to this new strategy “PSA Groupe” has to replenish not hundreds of small distributors, but only fourteen. The reduction of logistic costs was estimated around 70%.
- Bigger stock: repairers order spare parts from the hubs. These orders are composed of several lines. A line can be for example 100 filters or 50 pistons. The “Service Rate” measures the ability of the hubs to immediately satisfy the entire customer order, and it's calculated like this:

$$\frac{\text{Lines totally available} + 0.5 * \text{Lines partially available}}{\sum \text{Lines}}$$

A smaller number of big warehouses can guarantee a higher “Service Rate” rather than a bigger number of small warehouses. In particular, the new strategy can guarantee a “Service Rate” bigger than 85 %.

- Hubs can guarantee a higher frequency of deliveries from 2 to n times a day.
- Upstream optimized supply, in fact hubs buy products every day. This is advantageous for “PSA” because it’s a guaranteed gain.
- Hubs can provide a better management of products and a better stock turnover.
- They have a sales force and a call centre able to create customers and so revenues.

In the next figure there are the fourteen hubs, their name and where they are placed:



Figure 1: hubs map

The drawback of the hubs introduction is the loss of extensiveness in terms of reachable costumers. This disadvantage is explained by three main reasons:

- Lower number of distributors.
- Lower sales force: before the new strategy for each distributor there were at least two itinerant sellers (around 500 in total), while now they are only almost 120. Itinerant sellers are those people that goes through their assigned zone selling spare parts and promotion and creating customers.
- The fact that the small distributors were also shop centre where, for example, a repairer can go and buy immediately spare parts without an order. Now with the introduction of the hubs, if a repairer needs a particular product at a certain time of the day, he no longer can go to the small distributor where he can have it immediately. Therefore, not being able to wait the delivery times of the hubs, he will buy the piece from another part. With the new strategy "PSA" lost all this share.

3. My Role

The third chapter gives a general overview of what I do inside the company and, in order to understand the analysis that I do every day better, it shows the supply chain of spare parts.

My role in the “After Sales Department” is very wide. Every day I deal with different topics, people, Data and analysis.

I support mainly:

- Qualitative and quantitative KPIs analysis of the after sale network performances.
- Analysis of the hub’s spare parts sales and distribution.
- The development of Action plans in order to increase network performances.
- Spare parts and after sales Zone Manager team.
- Quality in terms of customer satisfaction.

Let’s describe the scenario in which the company operates and in which I am collocated:

“PSA Groupe Italy” buys spare parts from “Vesoul” (France), where there is the central warehouse, and sells them to the so-called hubs. These pieces are moved to the hubs or directly from “Vesoul”, or passing through a local warehouse placed in “Pregnana Milanese”. Both these serve all Italy, all the hubs. The difference is the type of order a hub can ask for. Two types of order:

- Stock order: an order, composed of several lines, arrives at least in three days. This type of order is named “J+3” (“J” stands for day).

- Urgent order: an order arrives at least in one day (“J+1”). The drawback is that “Urgent orders” costs 5 % more.

“Vesoul” issues only “Stock order”, while “Pregnana Milanese” both.

The hubs, in turn, sell the spare parts to the workshops and repairers. “PSA Groupe” invoice selling the pieces to the hubs, this turnover is called “Sell IN”. The so-called “Sell OUT” is what the hubs sell to repairers. Obviously higher is the “Sell OUT”, higher is the “Sell IN” and so the earning of the company. For this reason, the company goal is a big “Sell OUT” and, in order to achieve this result, it gives to the hubs bonus, benefits if they sell more. For instance, if the hub sells the 110% of the monthly objective “PSA” gives a 2,5% bonus on its sales. The problem is that the hub may decide to buy a smaller quantity of pieces from “PSA” and to sell them to repairers at a higher price so that they earn more money rather than what they could earn thanks to the bonus. Moreover, they have lower stock level, so lower stock holding costs and lower taxes. In this way the “Sell OUT” will be low and so also the profit of the company. The problem for the hubs is the competition, in fact they cannot rise too much prices because they are going to not sell anymore. The idea is to think at a bonus that is profitable both for us and the hubs. A bonus that is not too high for us, too high in the sense that we do not give to the hubs lots of moneys, and that is not too low for the hubs because otherwise they are going to buy less. The bonus must tempt the hubs to buy from us, and buy a lot.

It’s a price “game”, we (PSA) buy at a fictitious price “x”, sell at “x+y” (Sell IN) to the hubs, that, in turn, sell at “x+y+z” (Sell OUT). Following this reasoning our invoice will be “y”. In reality the count is more difficult because of discounts, extra discounts and promotions.

The chain ends with final clients that buy from repairers:

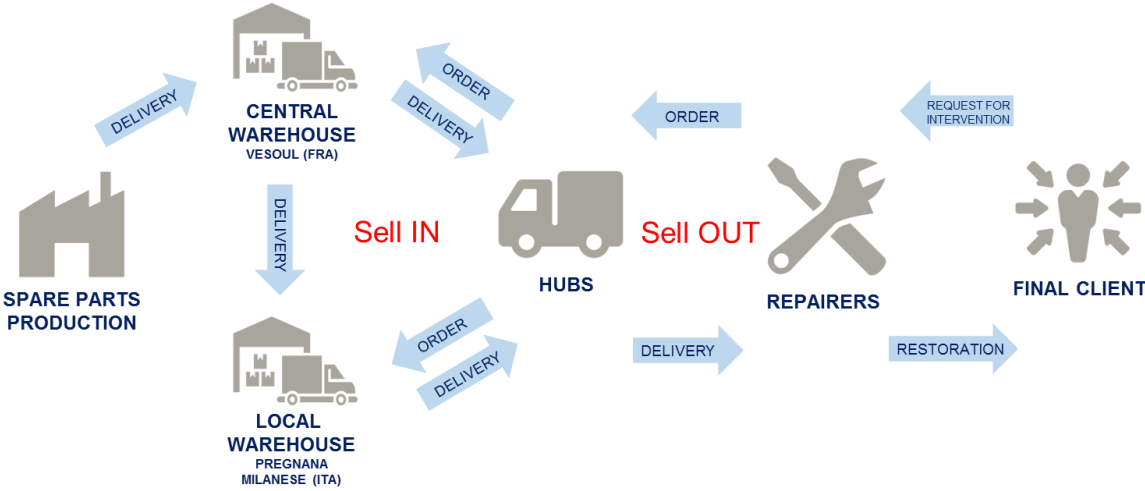


Figure 2: supply chain

My job in the “After Sales Department” is to monitor, to evaluate, to rework doing different analysis, through Excel and SAP, these values of “Sell IN” and “Sell OUT”, and also to compare them with past values.

4. My Analysis

This chapter wants to describe almost all the analysis that I carried out through these months with particular emphasis on those that I introduced. In order to understand them in the first three paragraphs I present the products that PSA sells, the types of clients served by the group and prices at which products are sold.

My analysis focus on three main topics:

- Sell IN: what enters the warehouses, what we sell to the fourteen hubs
- Stock: monetary value of stock
- Sell OUT: what comes out of the warehouses, what the hubs sell to the repairers

4.1 What we sell

“PSA groupe After Sales” sells mainly spare parts. The principal distinction is between Original Pieces (OP) and not original pieces, that include the “Eurorepar” products. “EuroRepar Car Service” (ERCS) is the European network of repairers specialized in the repair and maintenance of automobiles of all brands, born in France in December 2002. Since 2005, it’s also present in Italy, where it counts more than 350 participating repairers, supported by the spare parts supply network of PSA Groupe, able to quickly and efficiently cover the entire national territory. The Eurorepar” offer, that it is able to cover the 90% of the Italian circulating park, is advantageous because prices are really low, competitive and the quality it’s equal to the one of original pieces.

The spare parts are divided into thirteen macro families, let's call them indices. Inside these indices, that are coded with a specific number, there are all the marketing families. Let's introduce these indices with some example of marketing families:

Code	INDICES	Marketing Families	OP (Original Pieces) ?
1	0001 - Collision / Car Body	Windscreen, Headlight, Taillight, Bumper	X
2	0002 - Maintenance	Cleaner, Spark Plug, Wiper Blade	X
3	0003 - Accident mechanics	Cylinder Head, Valve, Shaft, Piston, Carter	X
4	0004 - Accessories	Spare Wheel, Alloy Wheel, Alarm System	X
5	0005 - Tires	various Tires Brands	
6	0006 - PPP (Prodotti Per Professionisti) Products for Professionalist	Engine Oil, Antifreeze Liquid, Liquid for Brakes	X
7	0007 - Eurorepar	Brake Pad, Spark Plug, Battery	
8	0008 - Wear	Bearing, Pipe, Brake Pad	X
9	0009 - Labels-Advertisement	Labels, Advertisement	
12	0012 - Equipement	Kit	
15	0015 - Stored Tires	various Tires Brands	
25	0025 - Eurorepar Tires	various Tires Brands	
36	0036 - Forwelt	Body Repair, Sealing Bonding	

Chart 1: indices

Almost all my analysis focus on Macro Families, Indices, in particular on the first eight indices: Original Pieces + Eurorepar + Tires.

4.2 To whom we sell

As explained before, “PSA Groupe” sells spare parts to the hubs, that, in turns, sells products to repairers. Here a distinction is needed. Repairers can be classified into ten families based on the type of client. Also these families are coded with a number. Let’s list them:

code	type of client
1	RA - Authorized Repairers
2	Authorized Workshop
3	ERCS
4	Independent Repairers
5	Body Shop
6	Grosses flottes
7	Sales between DoPR
20	Sales between Internal RA
22	Warranty
99	Other or Indefinite

Chart 2: types of clients

The difference between Authorized and not Authorized is the contract signed with “PSA Groupe”. The Authorized ones are RA (1), workshops (2), ERCS (3) and Body Shops (5). Most of the sales are done towards RA, Workshops, ERCS, Independent Repairers and Body Shops, therefore my analysis focus on them.

In conclusion we can classify the “Sell OUT” both by index and by type of client, while the “Sell IN” and the “Stock Value” only by index.

4.3 Type of Costs

A costs overview is needed before starting the description of my analysis. Let's start from the beginning. "PSA groupe" buys products at two prices:

- The "PBS" is how much PSA spends for products.
- The "PRL" is how much PSA spends for products including logistic costs.

$PRL = PBS * (1 + \%logistic)$ where %logistic depends on the type of product that has to be moved.

Because of privacy problem it's forbidden for me to know "PBS" and "PRL". For the same reason all the numbers that will appear in the chapter 4 analysis are re-scaled by multiplying them by a coefficient common to all the analysis. In this way percentages and trends are real while numbers they are not.

The company sells products to the hubs at three types of costs connected by discounts:

- PVP ("Prezzo Vendita Pubblico" in Italian) is the list price.
- PND ("Prezzo Netto Distributore" in Italian, "Net Distributor Price" in English) is the PVP to which the "PSA Discount" has been applied.
- PNDP ("Prezzo Netto Distributore Promo" in Italian, "Net Distributor Price Promo" in English) is the PND to which a promotion (Promo) has been applied.

The same discount reasoning can be done for what hubs sell to Repairers:

- PVP = List Price
- R el Factur e (in French) is how much Repairers pay for products. It's the PVP to which the Discount Table and promotion have been applied. The Discount table is a table that reports the recommended discount for each type of product, recommended from PSA to the hubs, it is not mandatory for the hubs to follow this table. This discount is equal to the

PSA discount minus on average 9/10 points. This amount of points depends on the type of product.

Let's give an example for the sake of simplicity. Let's consider:

- PVP = 100 €
- PSA Discount = 50%
- Promo = 10%, the promo discount has to be the same both for hubs and for Repairers
- Discount Table = PSA Discount – 10% = 40%

Given these data:

- $PND = PVP * (1 - PSA \text{ Discount}) = 100 \text{ €} * (1 - 0,5) = 50 \text{ €}$
- $PNDP = PVP * (1 - PSA \text{ Discount}) * (1 - Promo) = 100 \text{ €} * (1 - 0,5) * (1 - 0,1) = 50 \text{ €} * (1 - 0,1) = 45 \text{ €}$
- $R\grave{e}l \text{ Factur\`e} = PVP * (1 - Discount \text{ Table}) * (1 - Promo) = 100 \text{ €} * (1 - 0,4) * (1 - 0,1) = 60 \text{ €} * (1 - 0,1) = 54 \text{ €}$

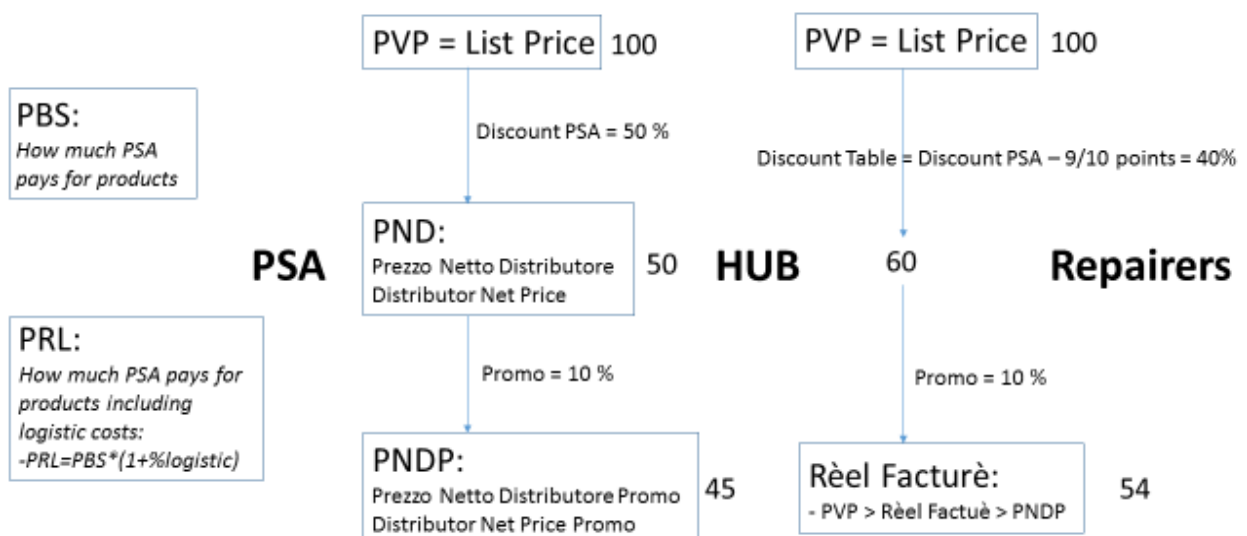


Figure 3: types of costs

Knowing these types of costs, it's easy to understand that we can measure the "Sell IN" with PVP, PND and PNDP, while the "Sell OUT" with PVP and R el Factur e. The strength of PVP is that we can compare "Sell IN" and "Sell OUT" directly, without considering any kind of discounts. Moreover, we can compare them also with the "Stock value" because the PVP is the only cost measure for the stock.

4.4 Sell IN

As previously described, the "Sell IN" is what "PSA" sells to the hubs and it can be measured in PVP or PND or PNDP.

At this point a distinction between the "Zone Managers" is needed. These can be divided in two groups:

- The "Zone Managers APV". "APV" stands for "apr s vente" that means after sales. They are twenty and each of them manages all the authorized repairers, workshops and body shops included in one zone. Obviously also the zones are twenty.
- The hubs Zone Managers. They are four and each of them manages one zone composed by a certain number of hubs. So Italy, sales, spare parts distribution and also the "Sell IN" can be divided by the fourteen hubs or by the four macro zones of competence of the Zone Managers:

zone	Zone Manager	hubs
Z1	Andrea Bettinelli	PCR MI
		Progetto Ricambi
		SDR
		DL Ricambi
Z2	Claudio Santulli	Dealernet
		Autocity
Z3	Roberto Gentilini	Company
		AV Service
		Pieralisi
		PCR RM
Z4	Valentino Covello	Autoclub
		Auto UNO
		Veisud
		Sirmec

Chart 3: Zone Manager - hubs

Every morning I have to compare the total “Sell IN” with the objective “PSA” wants to reach in the current month. The objective of a single hub is computed as what the hub buys from us in the same month of the previous year, multiplied by 1,1. It’s the 110% of what realized in the previous year. For example, if “Pieralisi” has bought 400000€ in march 2017, its goal of march 2018 will be 440000€. The global target is given by the summation of all fourteen hubs objectives.

We consider the total daily “Sell IN” as the summation of the turnover, what we have already invoiced to the warehouses, and the so-called “tubo”. The “tubo”, that I download from SAP, are all the orders already issued by or “Pregnana Milanese” or “Vesoul”, but not delivered to the hubs. To compute this “tubo” I have to set the window of days, which usually goes from the current day to a week before. This window cannot be too big because, being all the orders “J+3” or “J+1”, all the orders issued more than seven days before are going to not arrive or because they are cancelled orders or because of other problems. So if the window is bigger than a week all the orders that are going to not be delivered are included in the “tubo”, and so in the “Sell IN”. That’s wrong because in this way the percentage of achievement of the objective will be higher than the real one. We have decided to consider the

“tubo” within the “Sell IN” because that’s a certain gain, those orders that compose it are going to arrive to the hubs. Let’s give an example of what every day I send to “hubs Zone Managers” and on which they can work. I send the “Sell IN analysis”, measured at PND, both for zone and for hub:

For zone:

Zone	ZM	Total TURNOVER of the month	TUBO	Total TURNOVER of the month + TUBO	Forecast	Obj	% Forecast	% Obj
1P	A. BETTINELLI	9.919.879	1.780.091	11.699.970	40.250.000	42.842.800	29%	27%
2P	C.SANTULLI	4.389.123	915.373	5.304.496	18.200.000	25.094.300	29%	21%
3P	R. GENTILINI	8.281.022	2.934.190	11.215.212	39.200.000	40.763.800	29%	28%
4P	V. COVELLO	3.893.105	902.194	4.795.298	21.210.000	24.469.849	23%	20%
TOT		26.483.129	6.531.847	33.014.976	118.860.000	133.170.749	28%	25%

Chart 4: Sell IN for zone

For hub:

HUB	Total TURNOVER of the month	TUBO	Total TURNOVER of the month + TUBO	Forecast	Obj	% Forecast	% Obj	
DL RICAMBI	3.023.868	296.507	3.320.375	10.500.000	10.903.200	32%	30%	
PCR MILANO	4.403.662	667.602	5.071.263	17.150.000	17.001.600	30%	30%	
PROGETTO RICAMBI	1.110.975	215.586	1.326.561	5.600.000	4.997.300	24%	27%	
S.D.R.	1.381.374	600.397	1.981.771	7.000.000	9.940.700	28%	20%	
AUTOCITY	2.188.947	367.258	2.556.205	7.000.000	12.674.200	37%	20%	
DEALERNET	2.200.176	548.114	2.748.290	11.200.000	12.420.100	25%	22%	
AV SERVICE	1.864.423	231.708	2.096.131	11.900.000	13.028.400	18%	16%	
PCR ROMA	2.925.701	740.928	3.666.628	13.300.000	16.170.000	28%	23%	
PIERALISI F.LLI	858.916	158.235	1.017.151	5.600.000	5.397.700	18%	19%	
COMPANY SERVICE	2.631.982	1.803.319	4.435.302	8.400.000	6.167.700	53%	72%	
AUTO UNO	1.718.844	480.762	2.199.606	11.200.000	12.936.000	20%	17%	
AUTOCLUB SERVICE	1.182.697	194.840	1.377.537	4.410.000	4.774.000	31%	29%	
SIRMEC	163.772	32.023	195.795	1.400.000	1.462.249	14%	13%	
VEISUD	827.792	194.568	1.022.361	4.200.000	5.297.600	24%	19%	
TOT		26.483.129	6.531.847	33.014.976	118.860.000	133.170.749	28%	25%

Chart 5: Sell IN for hub

In this analysis as explained above I report the percentage of achievement of the objective, but also of the forecast. The forecast is what we expect to do according to a consultation between the Zone Manager and the hubs. These forecasts are updated every five days through the current month. This is the analysis of the sixth day of June.

At the end of the month the analysis is different because the orders are going to arrive at the next month and so we do not consider the “tubo”. Once a month is ended we “forget” about the “tubo” and we consider as the total “Sell IN” of that month only the turnover.

It’s important to notice that the total hub objective is given by the summation of the objectives of each index. In particular, by the “Original Pieces” objective plus “Eurorepar” objective. This is an analysis that it’s used a lot during the Business Review. Let’s report the “Sell IN” from January 2018 to May 2018 versus its objective, both for total, OP and Eurorepar:

HUB	TOT	obj TOT	% TOT	OP	obj OP	% OP	ERP	obj ERP	% ERP
AUTOCLUB SERVICE	29.598.679 €	25.071.200 €	118%	27.475.854 €	23.315.600 €	118%	2.122.825 €	1.755.600 €	121%
PIERALISI F.LLI	22.925.390 €	28.713.300 €	80%	19.050.828 €	26.095.300 €	73%	3.874.562 €	2.618.000 €	148%
VEISUD	25.448.182 €	30.076.200 €	85%	23.594.740 €	28.536.200 €	83%	1.853.442 €	1.540.000 €	120%
DEALERNET	56.517.305 €	60.036.900 €	94%	52.558.823 €	56.117.600 €	94%	3.958.483 €	3.919.300 €	101%
AUTO UNO	63.732.315 €	60.137.000 €	106%	60.911.414 €	57.288.000 €	106%	2.820.901 €	2.849.000 €	99%
DL RICAMBI	48.664.222 €	49.410.900 €	98%	46.248.058 €	47.247.200 €	98%	2.416.164 €	2.163.700 €	112%
AUTOCITY	42.151.683 €	50.211.700 €	84%	40.598.007 €	48.325.200 €	84%	1.553.677 €	1.886.500 €	82%
AV SERVICE	61.016.153 €	57.834.700 €	106%	57.676.194 €	55.124.300 €	105%	3.339.959 €	2.710.400 €	123%
COMPANY SERVICE	57.452.893 €	63.825.300 €	90%	53.698.817 €	59.567.200 €	90%	3.754.076 €	4.258.100 €	88%
S.D.R.	38.878.936 €	45.175.900 €	86%	36.542.571 €	41.379.800 €	88%	2.336.364 €	3.796.100 €	62%
PCR MILANO	79.893.444 €	91.984.200 €	87%	75.735.130 €	87.595.200 €	86%	4.158.314 €	4.389.000 €	95%
PCR ROMA	58.550.270 €	64.618.400 €	91%	54.888.634 €	61.253.500 €	90%	3.661.636 €	3.364.900 €	109%
PROGETTO RICAMBI	26.282.913 €	21.067.200 €	125%	25.286.970 €	20.127.800 €	126%	995.944 €	939.400 €	106%
TOT ITA	616.309.080 €	649.862.340 €	95%	578.909.977 €	613.581.749 €	94%	37.399.103 €	36.280.592 €	103%

Chart 6: Sell IN vs obj

Another analysis much used is the comparison between the daily “Sell IN” of different months. The daily “Sell IN” is computed as the total turnover of a month divided by the working days of that month. Let’s give the example of May vs April:

HUB	TOT			Eurorepar			Car Body		
	April	May	delta	April	May	delta	April	May	delta
AUTOCLUB SERVICE	241.810 €	245.753 €	3.943 €	13.210 €	19.199 €	5.989 €	86.133 €	72.703 €	- 13.430 €
PIERALISI F.LLI	182.335 €	155.654 €	- 26.682 €	10.431 €	10.769 €	338 €	50.892 €	42.649 €	- 8.243 €
VEISUD	163.277 €	315.371 €	152.094 €	8.064 €	24.444 €	16.380 €	38.569 €	143.463 €	104.894 €
DEALERNET	725.453 €	363.519 €	-361.934 €	38.273 €	40.616 €	2.343 €	240.717 €	101.817 €	-138.900 €
AUTO UNO	521.662 €	658.376 €	136.715 €	12.972 €	27.256 €	14.284 €	228.719 €	234.776 €	6.057 €
SIRMEC	91.771 €	29.691 €	- 62.080 €	27.441 €	1.426 €	-26.014 €	52.845 €	8.939 €	- 43.906 €
DL RICAMBI	503.682 €	471.165 €	- 32.517 €	41.329 €	14.210 €	-27.120 €	202.017 €	183.600 €	- 18.417 €
AUTOCITY	490.413 €	440.754 €	- 49.658 €	18.046 €	11.130 €	- 6.916 €	179.866 €	157.092 €	- 22.774 €
AV SERVICE	506.538 €	717.352 €	210.815 €	33.759 €	67.103 €	33.344 €	328.149 €	409.113 €	80.964 €
COMPANY SERVICE	629.019 €	539.020 €	- 89.999 €	42.426 €	16.742 €	-25.684 €	200.732 €	190.588 €	- 10.144 €
S.D.R.	379.453 €	443.292 €	63.839 €	16.452 €	36.890 €	20.438 €	138.624 €	121.518 €	- 17.106 €
PCR MILANO	789.273 €	504.429 €	-284.845 €	41.365 €	32.564 €	- 8.801 €	313.441 €	186.454 €	-126.987 €
PCR ROMA	602.726 €	488.609 €	-114.117 €	28.796 €	28.449 €	- 348 €	191.651 €	143.184 €	- 48.466 €
PROGETTO RICAMBI	244.044 €	279.981 €	35.937 €	7.141 €	14.399 €	7.258 €	111.365 €	163.723 €	52.358 €
TOT ITA	6.071.456 €	5.652.967 €	-418.489 €	339.706 €	345.198 €	5.491 €	2.363.721 €	2.159.620 €	-204.101 €

Chart 7: daily Sell IN

What I introduce is the study of the trend of the orders. Orders in terms of monetary value, for example, in the 12th of June were issued 3.500.000€ of orders, so the “Sell IN” of that day is 3.500.000€. The problem was that the objective of the month was divided in equal part in base of the number of days of that month. In other words, if the goal of June, that has 20 working days, is 120.000.000€, the daily “Sell IN” has to be equal to 6.000.000€. In this way the baseline that the “Sell IN” has to follow is linear. Being the baseline like this and comparing it with the real “Sell IN”, it turns out that every day, if we project the real trend with respect to the remaining days of the month, we are going to not reach our goal. This comparison is done both with the objective, what “PSA” want to sell to the hubs, and both with the forecast, what in our opinion we are going to give them. Usually the forecast is lower than the objective:

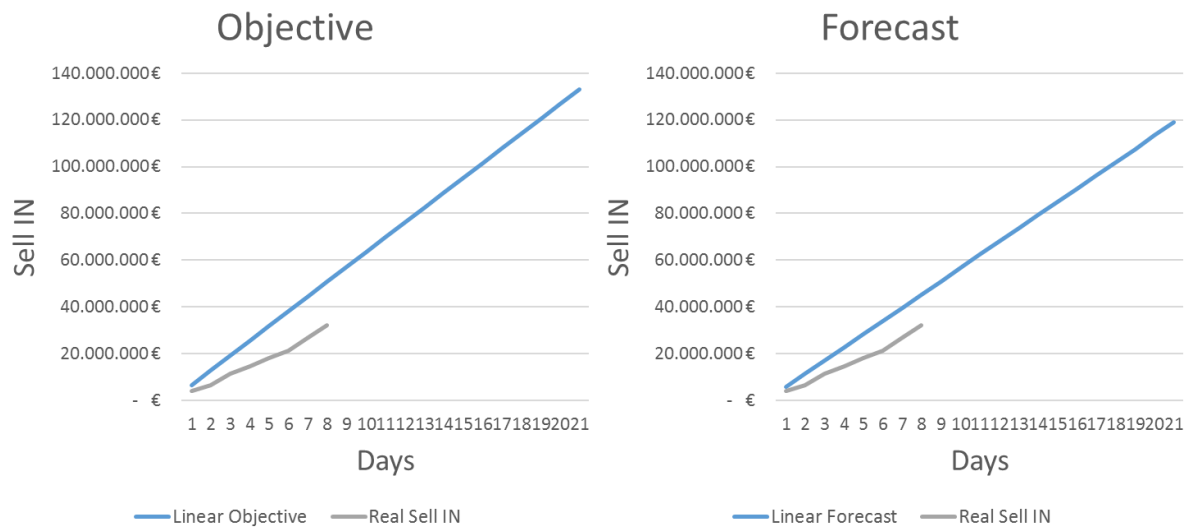


Figure 4: linear Objective/Forecast

According to the linear trend “PSA” always is going to not reach the objective and the forecast. This fact isn’t true, especially for the forecast. Inspecting the trend of the orders through different past months, I understand that this linear trend doesn’t represent the reality. Thanks to “Minitab” I applied a non-linear regression to past Data and I found that the orders follows a “Sigmoidally Shaped Function”, in particular a “Logistic Growth” described by this formula:

$$\text{Theta1} + \frac{\text{Theta2} - \text{Theta1}}{1 + \exp\left(\frac{x - \text{Theta3}}{\text{Theta4}}\right)}$$

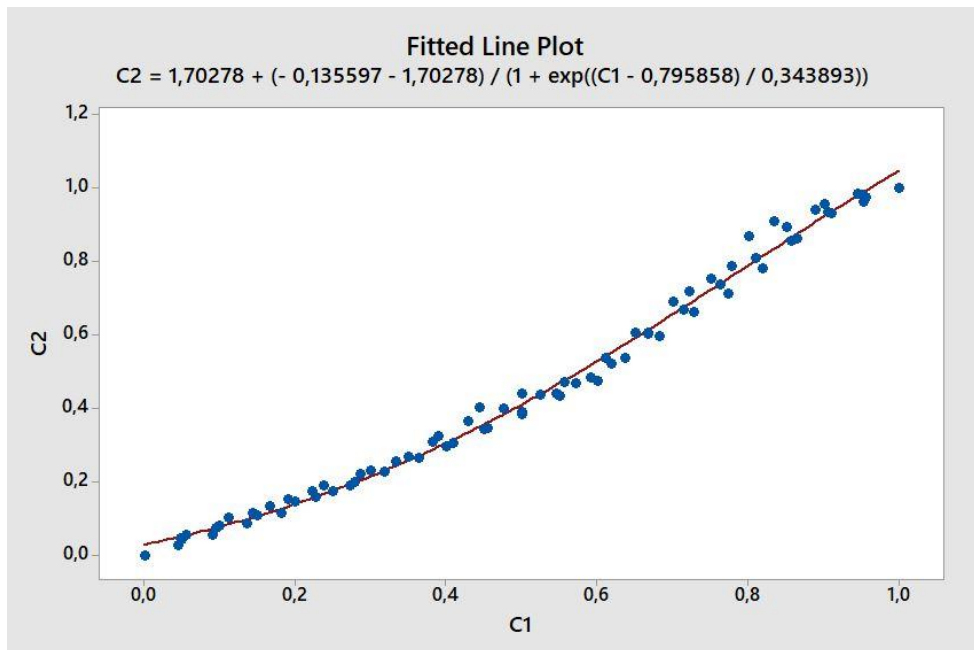


Figure 5: Minitab analysis

So a Logistic curve described by these parameters:

Theta1	1,70278
Theta2	-0,135597
Theta3	0,795858
Theta4	0,343893

Chart 8: Curve Parameters

Being this curve standardized between “0” and “1” both for “x” and “y” axes it’s easy to find how the orders have to be issued through the month in order to reach any objective within any number of day. For instance, the new objective and forecast baselines for June become:

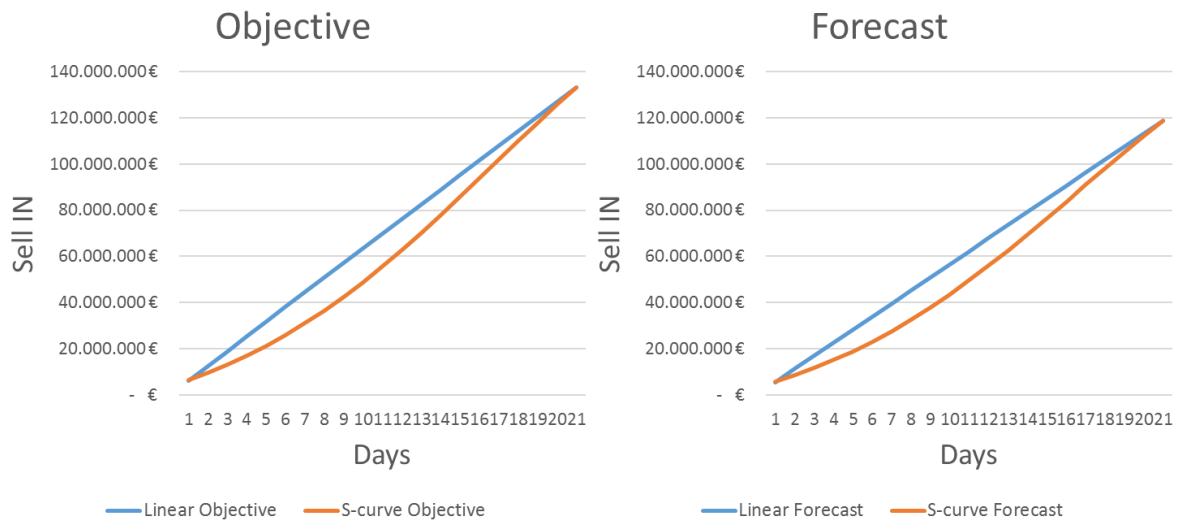


Figure 6: S-curve Objective/Forecast

Comparing the real “Sell IN” with the new baselines it turns out:

days	linear forecast	S-curve forecast	linear obj	S-curve obj	Real Sell IN
1	5.660.000 €	5.873.159 €	6.341.464 €	6.580.288 €	3.872.119 €
2	11.320.000 €	8.664.075 €	12.682.928 €	9.707.230 €	6.577.205 €
3	16.980.000 €	11.768.499 €	19.024.393 €	13.185.427 €	11.360.425 €
4	22.640.000 €	15.207.415 €	25.365.857 €	17.038.389 €	14.691.064 €
5	28.300.000 €	18.999.475 €	31.707.321 €	21.287.013 €	18.004.475 €
6	33.960.000 €	23.159.909 €	38.048.785 €	25.948.362 €	21.238.257 €
7	39.620.000 €	27.699.318 €	44.390.250 €	31.034.317 €	26.794.252 €
8	45.280.000 €	32.622.426 €	50.731.714 €	36.550.168 €	32.169.551 €
9	50.940.000 €	37.926.848 €	57.073.178 €	42.493.242 €	
10	56.600.000 €	43.601.977 €	63.414.642 €	48.851.657 €	
11	62.260.000 €	49.628.123 €	69.756.106 €	55.603.351 €	
12	67.920.000 €	55.975.991 €	76.097.571 €	62.715.502 €	
13	73.580.000 €	62.606.635 €	82.439.035 €	70.144.476 €	
14	79.240.000 €	69.471.957 €	88.780.499 €	77.836.383 €	
15	84.900.000 €	76.515.782 €	95.121.963 €	85.728.285 €	
16	90.560.000 €	83.675.510 €	101.463.428 €	93.750.045 €	
17	96.220.000 €	90.884.229 €	107.804.892 €	101.826.694 €	
18	101.880.000 €	98.073.176 €	114.146.356 €	109.881.190 €	
19	107.540.000 €	105.174.338 €	120.487.820 €	117.837.332 €	
20	113.200.000 €	112.122.993 €	126.829.284 €	125.622.606 €	
21	118.860.000 €	118.860.000 €	133.170.749 €	133.170.749 €	

Chart 9: orders analysis

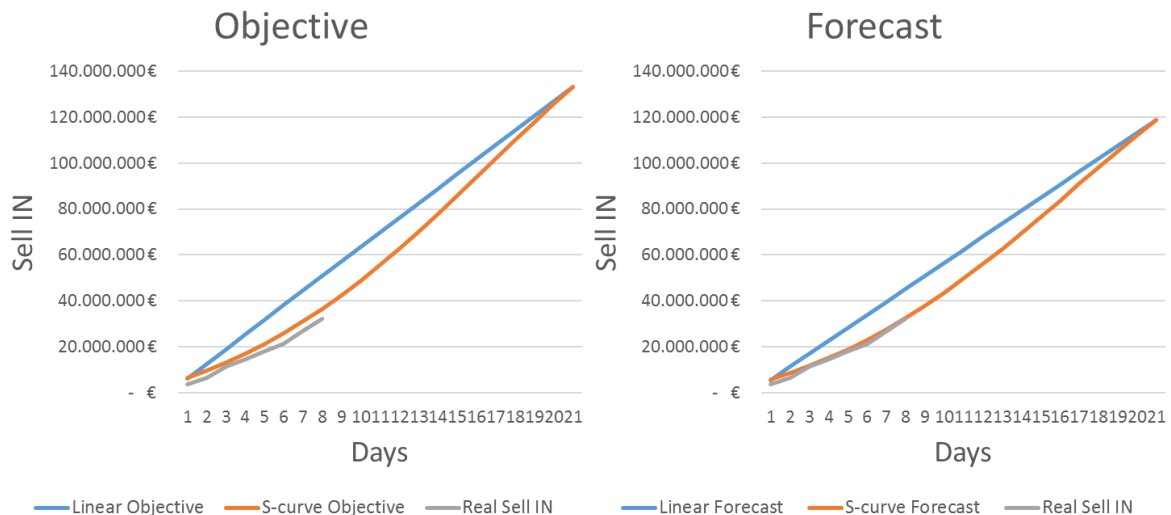


Figure 7: orders trend

From this table and these graphs, it's easy to understand that for sure we are going to not meet the objective both following the linear trend and the logistic trend. While probably we are going to reach the forecast according to the S-curve but not to the linear one.

This new analysis and this new baseline are very useful in order to understand the real situation, and to eventually think about a recovery plan if this situation is not good.

4.5 Sell OUT

The "Sell OUT" is what the hubs sell to repairers and it can be measured in "PVP" or "Rèel Facturé". It's very important for us because higher it is, higher is the "Sell IN" and so our turnover. Because of this reason most of my analysis focus on it.

Every morning I have to compare the current "Sell OUT" with the past sales, both for each hub and for the total Italy. In particular, every day I send to the hubs Zone Managers, in addition to the "Sell IN" analysis, the comparison between the "x" day of

the current month with the “x” day of the past months. Comparison in terms of “PVP”, “Rèel Facturé”, daily “Rèel Facturé” (“Rèel Facturé” / current number of days) and in terms of discount computed as:

$$\text{Discount} = 1 - \frac{\text{Rèel Facturé}}{\text{PVP}}$$

Let’s give an example:

hub	10th of May				11th of June			
	Pvp	Rèel Facturé	daily Rèel Facturé	discount	Pvp	Rèel Facturé	daily Rèel Facturé	discount
COMPANY SERVICE	€ 7.261.913	€ 4.972.581	€ 710.369	32%	€ 6.079.879	€ 4.312.867	€ 616.124	29%
DEALER NET	€ 4.654.234	€ 3.496.176	€ 499.454	25%	€ 4.993.490	€ 3.775.022	€ 539.289	24%
AUTOCITY	€ 3.193.243	€ 2.464.931	€ 352.133	23%	€ 3.130.454	€ 2.433.764	€ 347.681	22%
PCR MI	€ 6.657.182	€ 4.965.780	€ 709.397	25%	€ 6.370.174	€ 4.670.576	€ 667.225	27%
PROGETTO RICAMBI	€ 3.026.708	€ 2.076.050	€ 296.579	31%	€ 4.983.017	€ 3.419.080	€ 488.440	31%
S.D.R	€ 3.789.923	€ 2.858.947	€ 408.421	25%	€ 3.697.337	€ 2.751.813	€ 393.116	26%
DL RICAMBI	€ 4.526.349	€ 3.333.733	€ 476.248	26%	€ 4.266.790	€ 3.127.666	€ 446.809	27%
AV SERVICE	€ 5.938.560	€ 4.247.305	€ 606.758	28%	€ 6.713.828	€ 4.498.892	€ 642.699	33%
PIERALISI	€ 2.040.424	€ 1.430.593	€ 204.370	30%	€ 1.865.030	€ 1.359.648	€ 194.235	27%
PCR RM	€ 7.769.660	€ 5.171.616	€ 738.802	33%	€ 8.001.077	€ 4.806.025	€ 686.575	40%
AUTOCLUB	€ 2.491.114	€ 1.791.965	€ 255.995	28%	€ 2.620.311	€ 1.837.569	€ 262.510	30%
AUTO UNO	€ 4.998.015	€ 3.486.892	€ 498.127	30%	€ 6.620.723	€ 3.860.874	€ 551.553	42%
VEISUD	€ 2.727.630	€ 1.951.305	€ 278.758	28%	€ 2.377.884	€ 1.739.642	€ 248.520	27%
TOT ITA	€ 59.074.953	€ 42.247.874	€ 6.035.411	28%	€ 62.266.386	€ 42.946.846	€ 6.135.264	31%
Daily ITA	€ 8.439.279	€ 6.035.411		28%	€ 8.895.198	€ 6.135.264		31%

Chart 10: daily Sell OUT

This example reports the comparison between the seventh day of June with the seventh day of May. Red colour indicates that the daily “Rèel Facturé” is lower than the past one, the green one viceversa. During this internship I learned that numbers without any bullet point do not mean anything. There must always be an analysis, a comparison with another number. For instance, here, the colours are the bullet points, they are very simple in this case, but they are very efficient.

Lots of aspects of the “Sell OUT” are very interesting, in fact we analyse it for index, for the type of client and for the number of clients served in a given period, moreover

we analyse its trend trough different months. Let's report an example for the sake of completeness:

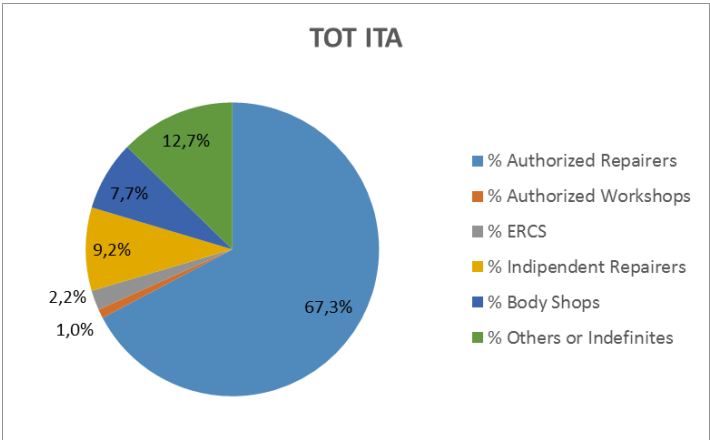


Figure 8: Italian Sell OUT for type of client of May

What's new and what we introduced since my stage has begun are two very important aspects:

- Sell OUT for Circulating Park
- Loyalty analysis

4.5.1 Sell OUT for Circulating Park (CP)

The Circulating Park represents how many vehicles there are in a certain zone. A general authorized repairer has to buy spare parts only from the hub with which he has signed the contract. Given this hypothesis, that in reality isn't true (this fact it's then analysed in the following chapter regarding the loyalty analysis), the total circulating park of a hub is computed as the summation of all the cars that the repairers, associated to that hub, can reach. Let's report these data:

Circulating Park 2018	
SDR	108038
Pieralisi	50298
Autoclub	57693
Company	113138
Veisud	78304
Progetto Ricambi	33693
Auto Uno	136669
Dealernet	125996
PCR MI	188620
PCR RM	148764
DL Ricambi	93733
Autocity	111820
AV Service	98858
TOT ITA	1345625

Chart 11: Circulating Park

Dividing the “Sell OUT” over the circulating Park is very powerful because, in this way, the sales of different hubs are comparable. Let’s consider an example. Given the “Sell OUT” of “SDR” equal to 200.000€ and the one of “Progetto Ricambi” equal to 100.000€ it’s no sense saying that “SDR” is performing better than “Progetto”, in fact, dividing the sales for the CP it turns out the opposite situation, “Progetto is the best hub”:

$$Progetto: \frac{100.000€}{33693} = 2,96 > 1,85 = \frac{200.000€}{108038} : SDR$$

This new statistic is useful because is comparable also with the “Sell OUT” objective the hubs have to meet in order to have bonus from “PSA”. Let’s explain how this objective is calculated. Bonus are given to the hubs only for the sales of four indices (Collision / Car Body, Maintenance, Eurorepar, Wear). For each of these indices a monthly objective ratio, based on the sales volumes of the past year, is established. A Ratio tells us how much the hub has to sell for a single index to a single vehicle. So for each index there is one ratio. It’s easy to understand that the total index goal is given by the ratio times the circulating park and that the total hub objective is:

$$\sum_{i=1}^4 Ratio_i * Circulating Park \quad \text{where } i = \text{indices}$$

Comparing the sales of an index divided by the circulating park, with its Ratio we get which hubs obtain the bonus for that index. Let's give as example the analysis made in June for "Eurorepar" index:

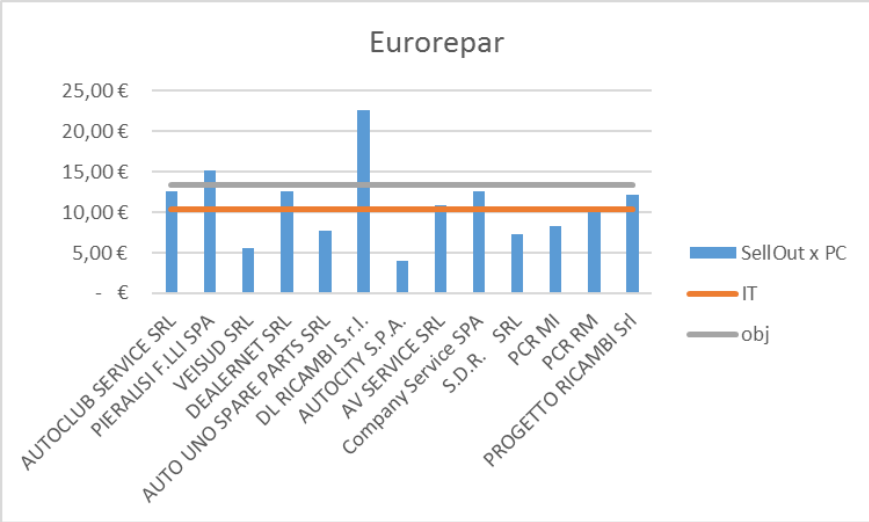


Figure 9: Sell OUT x Circulating Park

From Figure 9 it turns clearly out that "DL Ricambi" is going to receive the bonus, while "Autocity" not. The red line indicates the Italian situation computed as total "Sell OUT" over the total circulating park. It is under the objective one, this means that on average hubs are not going to get the bonus.

Dividing the Ratio by the number of days in a given month we obtain how much the hub has to sell daily to a single car for a single index. Comparing this result with the daily "Sell OUT" for index over the Circulating Park and with its trend it's easy to understand if a hub is going to overcome the objective line at the end of the month. Let's give as example the trend of the Maintenance index of "AV Service" through May, precisely on the 11th day of the 22 working days:

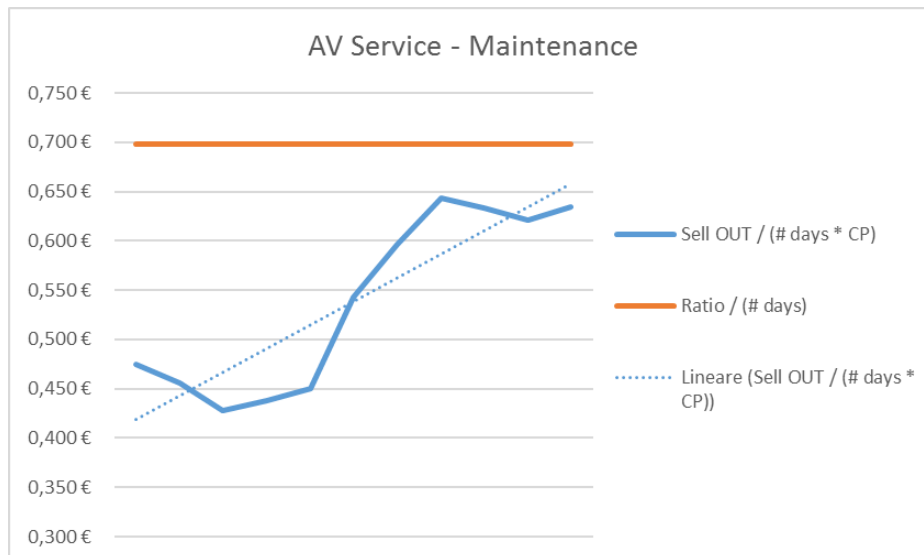


Figure 10: daily Sell OUT x Circulating Park

The linear trend shows that probably on the remaining days of the month the objective line is going to be reached, in fact this is happened. This is an analysis that I send around three times a month to the hub Zone Manager that is very useful for them because they can understand at which point their hubs are and on which index to focus efforts.

4.5.2 Loyalty analysis

In order to understand this analysis a brief introduction on the repairers is needed. An “Authorized Repairer”, who buys spare parts from the hub, is composed by some bridges on which the dedicated producers work. Let’s give some numbers, on average there are “4,9” bridges for a repairer and “4,3” dedicated producers, so “0,9” producers for one bridge. Through an investigation done on some sample “Authorized Repairers”, we learnt that one dedicated producer works on, in one year, around 700.000€ (considering the multiplying coefficient) of spare parts measured in “List Price” (“PVP”). Because of what comes out must come in, the repairer has to buy from the hub that amount of money in “PVP” for each producer. Thanks to this investigation we understand that the “Potential of Purchase”, within a year, of a repairer from the hub is equal to 700.000€ for one producer. The “Loyalty analysis” is

born in order to investigate all the “Authorized Repairers” that do not buy that “Potential” from the hub. If a repairer doesn’t buy spare parts for its “Potential” it means that it probably purchases products from another part. This fact can happen because of many reason:

- a cheaper price: the repairer purchases the same product from another part, from another seller at a lower price rather than from the hub.
- lower logistic costs: the repairer purchases the same product, at the same price, from another seller because the seller may be closer than the hub, so with lower logistic costs.
- Consuetude: the repairer has always bought spare parts outside before the creation of hubs, and by custom he decided to continue like this.

A repairer is “loyal” if buy all, or more, of its “Potential”, “not loyal” viceversa. The scope of this analysis is to understand which repairers are “not loyal”, why they are not, how much they are buying out, the so-called “lost Turnover”, and to bring it back to us.

Knowing the seasonality of the sales it’s easy to distribute the “Potential of Purchase” through the months:

Gen	Feb	Mar	Apr	Mag	Giu	Lug	Ago	Set	Ott	Nov	Dic	TOT
6,7%	7,9%	8,4%	7,5%	8,5%	8,5%	9,3%	6,9%	9,5%	9,3%	9,3%	8,2%	
47.005	55.571	58.766	52.234	59.659	59.524	64.929	48.047	66.498	65.169	64.946	57.651	700.000 €

Chart 12: Seasonality

Another distinction must be introduced in order to compute the “Potential”. An “Authorized Repairer” can be also “CVN” or not. The acronym “CVN” means that the repairer is also a car seller. These, obviously, must be more loyal than the others. In order to take this difference into account we assign two different objectives, targets for the percentage of “Loyalty”:

- “Authorized CVN Repairers” must be loyal for the 95%. They must buy the 95% of their “Potential”.
- General “Authorized Repairers” must be loyal for the 85%. They must buy the 85% of their “Potential”.

In order to make “CVN” and not “CVN” comparable we decide to multiply the “Potential” for these two percentage obtaining one unique target: 100%. In conclusion the “Potential of Purchase” of an “Authorized Repairers” is calculated like this:

“Potential of Purchase”

$$= \# \text{ of dedicated producers} * \text{seasonality} * \text{target percentage} * 700000\text{€}$$

The “Loyalty Analysis” is useful to investigate both the single repairer and the single hub. The hub in terms of sum of all repairers that have signed a contract with it. For the single repairer it is simply a comparison between its “Potential” within a period, that can be a month, a year, a quarter, and what it bought from the hub with which it signed the contract, so the “Sell OUT” of the hub to that repairer. If it is “Not Loyal” we compute the “Percentage of Loyalty” as follow:

$$\text{“Percentage of Loyalty”} = \frac{\text{“Sell OUT” within a given period}}{\text{“Potential of Purchase” within a given period}}$$

The Analysis of the hub’s loyalty starts from the one of the single repairer. We calculate three parameters for the hub:

- “Loyalty Rate”: this rate takes into account the amount of loyal repairers inside the hub’s zone with respect to the total one. It is computed as the number of loyal divided by the total number:

$$\text{“Loyalty Rate”} = \frac{\# \text{ Loyal}}{\# \text{Loyal} + \# \text{ Not Loyal}}$$

- “Percentage of hub Loyalty”: starting from the “Potential of Sales” of the hub, that is calculated as the sum of all the “Potential of Purchase” of all the repairers of the considered hub, the “Percentage of hub Loyalty” is:

“Percentage of hub Loyalty”

$$\begin{aligned} &= \frac{\text{“Sell OUT” of the considered hub within a given period}}{\text{“Potential of Sales” within a given period}} \\ &= \frac{\text{“Sell OUT”}}{\sum_i \text{“Potential of Purchase”}} \quad \text{where } i = \# \text{ of repairers} \end{aligned}$$

- “hub Lost Turnover”: this indicates the amount of spare parts, measured in “PVP”, “List Price”, that the hub didn’t sell to the not loyal repairers. It’s computed as the summation of the “repairer Lost Turnover” of all the not loyal repairers associated to the hub. The “repairer Lost Turnover” is calculated as the difference between the “Potential of Purchase” of that repairer and the “Sell OUT” of the hub to the considered repairer:

“hub Lost Turnover”

$$\begin{aligned} &= \sum_i \text{“repairer Lost Turnover”} \\ &= \sum_i (\text{Potential of Purchase”} - \text{“Sell OUT”}) \quad \text{where } i = \\ &= \# \text{ not loyal repairers} \end{aligned}$$

Let's provide as example the loyalty analysis considering its development through March, April and May:

Hub	Loyal?	March			April			May		
		Yes/No March	Loyalty Rate March	Lost Turnover March	Yes/No April	Loyalty Rate April	Lost Turnover April	Yes/No May	Loyalty Rate May	Lost Turnover May
AUTO UNO	no	39	39%	3.112.667 €	40	38%	2.388.857 €	35	45%	2.759.844 €
	yes	25			24			29		
AUTOCITY SPA	no	40	31%	3.054.316 €	35	40%	2.565.947 €	34	41%	2.789.538 €
	yes	18			23			24		
Autoclub Service Srl	no	24	27%	1.770.896 €	24	27%	1.449.044 €	22	33%	1.400.467 €
	yes	9			9			11		
AV SERVICE	no	44	25%	3.390.463 €	44	25%	3.934.736 €	38	36%	2.748.150 €
	yes	15			15			21		
COMPANY SERVICE	no	36	43%	3.441.375 €	37	41%	2.662.482 €	34	46%	2.493.876 €
	yes	27			26			29		
DEALERNET SRL	no	44	25%	5.047.604 €	46	22%	4.920.586 €	48	19%	5.174.400 €
	yes	15			13			11		
DL RICAMBI	no	22	48%	2.270.117 €	23	45%	1.504.679 €	17	60%	1.077.847 €
	yes	20			19			25		
PCR MI	no	38	54%	2.355.465 €	31	62%	1.980.932 €	29	65%	1.977.547 €
	yes	44			51			53		
PCR RM	no	41	42%	3.598.525 €	39	45%	3.494.095 €	38	46%	3.070.173 €
	yes	30			32			33		
PIERALISI F.LLI	no	24	23%	1.226.942 €	23	26%	1.197.138 €	21	32%	979.041 €
	yes	7			8			10		
PROGETTO RICAMBI	no	11	48%	511.136 €	8	62%	296.365 €	7	67%	300.479 €
	yes	10			13			14		
S.D.R.	no	31	45%	2.258.345 €	27	52%	1.603.966 €	27	52%	1.907.612 €
	yes	25			29			29		
VEISUD SRL	no	15	52%	1.115.654 €	16	48%	1.132.299 €	18	42%	1.216.972 €
	yes	16			15			13		
TOT ITA	no	409	39%	33.153.504 €	393	41%	29.131.124 €	368	45%	27.895.945 €
	yes	261			277			302		

Chart 13: Loyalty Analysis

From this chart it turns out that in all of the months the “Loyalty Rate” is under objective 100%. Even if this is not a good result, it's easy to understand that, since we have put our attention on loyalty and thanks to the work done by both “hub Zone Manager” and “Zone Manager APV” in these three months, the trend is positive. In fact, The Italian “Loyalty Rate” is increased by 6 points from March to May, and also the “Lost Turnover” is decreased by around 5.200.000€.

4.6 Sell IN vs OUT vs Stock

Since I joined the company it has been introduced also the comparison between “Sell IN”, “Sell OUT” and “Stock”. This is possible only measuring all of them at the “List Price”, “PVP”. In other terms the “Sell IN” is what enters the hub warehouses, the “Stock” is what is in the warehouses, and the “Sell OUT” is what goes out.

Computing the delta between the “Sell OUT” and the “Sell IN” we can understand if a hub is stocking or not, in particular it is interesting calculating this data for each index. Let’s report as example this analysis considering the Original Pieces and as period May:

hub	Sell Out Original Pieces	Sell IN Original Pieces	Out - IN	Stock Value Original Pieces
AUTOCLUB SERVICE SRL	7.134.072 €	7.623.358 €	- 489.286 €	23.073.627 €
PIERALISI F.LLI SPA	5.527.915 €	4.491.603 €	1.036.311 €	17.109.535 €
VEISUD SRL	7.791.836 €	10.605.589 €	- 2.813.754 €	12.295.579 €
DEALERNET SRL	14.670.299 €	10.092.531 €	4.577.769 €	24.859.001 €
AUTO UNO SPARE PARTS SRL	21.786.604 €	22.433.708 €	- 647.104 €	17.856.422 €
SIRMEC SRL	2.420.183 €	922.554 €	1.497.629 €	4.407.338 €
DL RICAMBI S.r.l.	13.691.969 €	14.805.949 €	- 1.113.980 €	19.154.077 €
AUTOCITY S.P.A.	10.345.217 €	14.614.794 €	- 4.269.577 €	15.407.926 €
AV SERVICE SRL	16.233.420 €	21.548.212 €	- 5.314.791 €	32.499.824 €
Company Service SPA	19.714.936 €	17.276.105 €	2.438.831 €	22.871.397 €
S.D.R. SRL	11.801.350 €	13.681.086 €	- 1.879.736 €	17.845.976 €
PCR MI	23.528.807 €	14.825.794 €	8.703.013 €	36.433.792 €
PCR RM	16.264.920 €	14.467.208 €	1.797.712 €	26.423.774 €
PROGETTO RICAMBI Srl	8.423.018 €	8.625.952 €	- 202.934 €	8.142.737 €
TOT ITA	179.334.546 €	176.014.443 €	3.320.103 €	278.381.004 €

Chart 14: Sell OUT – Sell IN

The red colour indicates that the hub is stocking. This is not good for the company because it means that the hub is not selling how much it buys from us. This negative trend results in the fact that the hub is going to buy less spare parts from us in the immediate future.

What is new and important is also the introduction of the measurement of the warehouses productivity performances. This is done through two indices (“Stock

Turnover Index” and “Days of Inventory”) and the so-called ABC-ABC analysis. The “Stock Turnover Index” corresponds to the average frequency of considered inventory renewal during a given time.

While the “Days of Inventory” indicates the number of days of consumption which the stock can cover. Both are computed on formula based on the comparison between the Stock Value and the “Sell OUT” :

$$\text{Stock Turnover Index} = \frac{\sum \text{Consumption in a given period}}{\text{Average Stock in a given period}} = \frac{\text{Sell OUT}}{\text{Stock}}$$

$$\text{Days of Inventory} = \frac{\text{Days in the given period}}{\text{Stock Turnover Index}} = \frac{\text{Stock}}{\text{Sell OUT} / \#days} = \frac{\text{Stock}}{\text{Sell OUT}} * \#days$$

It’s important to calculate these two indices for all the indices in order to make the Zone Managers possible to implement recovery plans, action plans. For instance, if the Tires have a big “Days of Inventory” it means that probably the offer is not advantageous for the repairer that wants to buy them. A possible action plan for this situation is to think about a promotion for tires, with higher discounts.

“ABC-ABC analysis” is very useful for the same reason and also in order to investigate the obsolescence and the stock out. It consists of identifying the classification parameters (stock and consumption) and analysing the items, in our case the indices, according to ABC classifications. The objective is to enhance the focalization of improvement actions. Each index is classified with “A”, “B” or “C” for both two parameters. In order to understand how this classification works let’s consider as parameter the “Stock”, for the consumption is the same. A “Pareto” analysis is used. The indices are ordered in a descendent way from the one that has the highest “Stock” value, measured at “PVP”, to the lowest. Then for each index is

computed its percentage on the total value. These percentages are cumulated and basing on this, indices are evaluated with:

- “A”: all the indices that contributes for the 80% of the total stock value
- “B”: all the indices that contributes for the 15% of the total stock value
- “C”: all the indices that contributes for the remaining 5% of the total stock value

Let’s consider as example “PCR MI” within the two month of March and April:

Index	Stock	%	cum %	A/B/C	Index	Sell OUT	%	cum %	A/B/C
0001 - Collision / Car Body	11.808.127 €	23%	23%	A	0001 - Collision / Car Body	13.893.533 €	28%	28%	A
0003 - Accident mechanics	11.747.666 €	23%	46%	A	0003 - Accident mechanics	9.809.057 €	20%	48%	A
0008 - Wear	9.837.350 €	19%	65%	A	0008 - Wear	7.754.002 €	16%	64%	A
0002 - Maintenance	7.146.617 €	14%	79%	A	0005 - Tires	4.711.545 €	10%	74%	A
0007 - Eurorepar	6.726.824 €	13%	92%	B	0002 - Maintenance	4.685.020 €	10%	83%	B
0004 - Accessories	1.570.900 €	3%	95%	B	0006 - PPP	2.969.266 €	6%	89%	B
0006 - PPP	1.459.621 €	3%	98%	C	0007 - Eurorepar	2.851.556 €	6%	95%	C
0005 - Tires	860.814 €	2%	99%	C	0004 - Accessories	2.234.991 €	5%	100%	C
0036 - Forwelt	272.689 €	1%	100%	C	0025 - Eurorepar Tires	82.736 €	0%	100%	C
0009 - Labels-Advertisement	19.285 €	0%	100%	C	0009 - Labels-Advertisement	17.191 €	0%	100%	C
0025 - Eurorepar Tires	11.956 €	0%	100%	C	0036 - Forwelt	7.859 €	0%	100%	C
0012 - Equipment	322 €	0%	100%	C	0012 - Equipment	1.568 €	0%	100%	C

Chart 15: Pareto Analysis

At this point, crossing the “Stock” and the “Sell OUT” a chart with nine possible combinations is obtained:

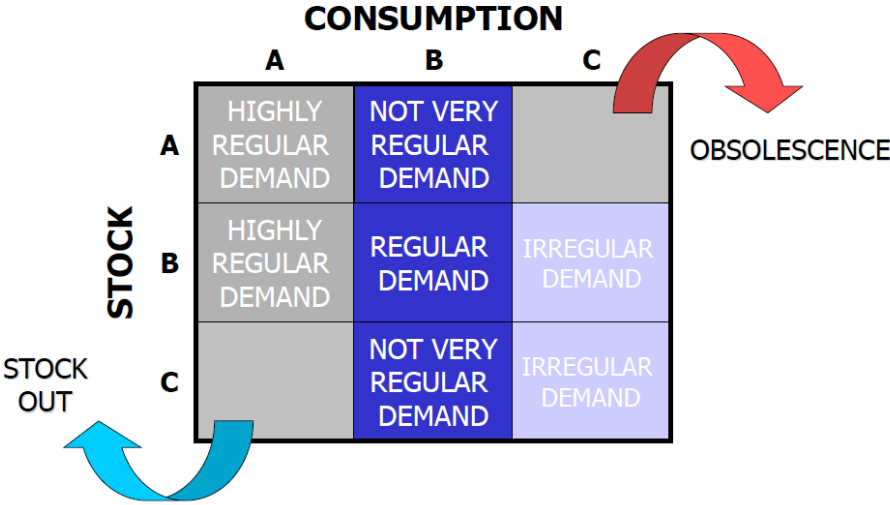


Figure 11: ABC ABC charts

The critical combinations for the “Sell OUT – Stock” are “A - C” and “C - A” for which Stock OUT and Obsolescence respectively occur:

- Stock OUT: It is the situation in which the demand or requirement for an item cannot be fulfilled from the current inventory.
- Obsolescence: It is the situation in which the inventory of an item has not been sold or used for a long period of time and is not expected to be sold in the future.

Let’s report the “ABC-ABC analysis” for PCR MI:

Index	Sell OUT	stock	turnover	cover
0001 - Collision / Car Body	A	A	1,18	0,85
0003 - Accident mechanics	A	A	0,83	1,20
0008 - Wear	A	A	0,79	1,27
0005 - Tires	A	C	5,47	0,18
0002 - Maintenance	B	A	0,66	1,53
0006 - PPP	B	C	2,03	0,49
0007 - Eurorepar	C	B	0,42	2,36
0004 - Accessories	C	B	1,42	0,70
0025 - Eurorepar Tires	C	C	6,92	0,14
0012 - Equipement	C	C	4,86	0,21
0036 - Forwelt	C	C	0,03	34,70
0009 - Labels-Advertisement	C	C	0,89	1,12

Chart 16: ABC ABC PCR MI

From this chart it turns out the Stock OUT problem for the tires index. This fact is confirmed by the high number of turnover through the two months and by the low number of days that the inventory can cover. The 0,18 indicates that the stock can cover the 0,18 of the two months.

5. What can be improved

The Chapter has the task of explain in my opinion how the company, my role can be improved and how problems, in particular the communication one, can be solved.

My position is very interesting because it is very dynamic. Every day I treat different problems with different people with which I have the opportunity to learn new things. Inside my role there are few things that do not work so good and that can improve my position, my work, in term of velocity and efficiency. In my opinion, in a hypothetic future PSA has to work on one principal guideline: The Communication and the exchange of information both within the “After Sales Department” and with others departments. Inside the “After Sales Department” there are many offices plus the “field”:

- Marketing office: it has different tasks like the management of promotions and of the communication both B2B (hubs) and B2C (repairers), like the definition of products, their discounts and so their price. Moreover, the definition of thresholds, targets and the management of the Budget.
- Warranty office: warranties are managed in this way: if a repairer has to make a warranty intervention he pays directly for the piece which will then be reimbursed by us. The problem is that this fact generates “Sell OUT” for the hub from which the spare parts is bought. This “Sell OUT” is not real because there isn’t a gain for us. Warranty office is important for our department because it has to manage all these interventions, but also because it has to give us the part of “Sell OUT” composed by warranties in order to subtract it from the total one. It’s important because in this way “PSA” is not going to pay bonus to the hubs for the warranty “Sell OUT”.
- Technical Service office: this office has to manage all the recall campaigns, the vehicles registrations and therefore the circulating park.
- Field: The field means all the “Zone Managers” that work on the hubs and repairers, going through Italy and promoting our products.

The problem is that there is not a correct exchange of information between all these offices. The communication happens only when a problem or a need rises. For instance, every month I have to ask to the marketing office the objective ratio described in the chapter 4.5.1 (Sell OUT for Circulating Park). In this way there is no a complete knowledge of what the other offices are working on. In an opposite situation many problems can be solved together, new idea can rise, the efforts of different offices can be joint in order to reach a common goal improving the company performance. A simple meeting, once a month, in which all the offices show how the month is going, their problems and their new projects can solve this communication issue. Also the fact that there are too many useless mails, too many mails for the explanation of one concept or for a single discussion, contributes to the accentuation of that problem. These can be replaced by one single call. A solution can be deciding a threshold for the number of mails in one day. This has been already implemented in some companies and results show the increasing of performances.

As well as within the departments, inside the building, the communication problem is also observed outside. In fact, "Zone Managers" have always to wait that someone sends them the numbers, and in many case they receive this information while they are driving not having the possibility to watch them on the computer. They have also to go on the web to look at results, often using the phone where websites and numbers are not clearly visible. A simple "App" can solve this problem.

6. What I have learnt and conclusions

The sixth chapter gives a general overview of the lots of things that I learnt thanks to this stage. It shows also why it has been important for me and why this experience completes my course of study.

This internship has been very useful for me. In addition to the study of the sales performance, I had the opportunity to be part of different aspects of the centre, going from quality controls to back and front office operations. These and the relationship with other departments, like the new vehicle sales department, have allowed me to have a complete view of how a great multinational, “PSA Groupe”, works. During these months I have also been able to acquire new practical skills, particularly in the use of new operating and management systems, and to improve interpersonal skills and human relationships. Regarding the last ones, I learnt how to behave with colleagues thanks to everyday activities, and also with leaders, thanks to active participation in technical meetings. In these reunions, usually, me, my tutor and leaders speak about the technical presentations that I prepare for the so-called “Field Meetings”, meetings with Zone Managers rather than with Italian CEO or French people. In these presentations are reported all the analysis, the numbers on which I work every day. Because of this my role has responsibility and for this reason I understand how to work under pressure. In addition, I also learnt how to speak in front of an audience, how to manage myself with respect to the big amount of workload, how to plan all the activities I have to do through days, weeks and months, to be punctual and precise. I increased my interpersonal skills also through human resources activities like the “Reverse Mentoring”. This consists in a series of meetings, one a week, in which an “under 30” has to teach something to an “over 45”. The subject in question is not important, in fact, the scope is the exchange, between people from different generations, of idea and thoughts. The final goal is that one understands the way of thinking and reasoning about the other, in order to make the company younger in thinking and more smart. Because of all these interpersonal skills acquired, I think that this stage completes my course of study adding to the technical ability learnt through the five years at “Politecnico di Milano”, the human ones.

Another important thing is that my tutor allows me to think on what I am doing and to apply what I studied, for instance the “ABC ABC analysis” and the non-linear regression. Not only what I studied but also to apply the way of reasoning, the way to deal with a new problem that “Politecnico di Milano” has thought to its students. This fact is very important because for me it means that he trusts me, my knowledge and my skills.

In conclusion, I am really satisfied of the internship, of the route taken with “PSA Groupe” hoping that this is only the begin.

Thanks

I want to thank first of all prof. Alessandro Brun for his time and for all his precious advices that allow me to write this report.

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