

READERSHIP, A FAVOUR TO MAGAZINES: SALES OPTIMIZATION

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In those time where sales by issue are not in an increasing trend in France, even if they are balanced with very good levels of subscription , and where distribution network are dealing with bad economic situation, the News Magazine Syndicate (SPMI) has decided to go further on reflection about optimisation of sales, and share his effort with the national company for press delivery (NMPP).

As using only geomarketing datas revealed to be insufficiently helpful , Réseauscopie is based on a better knowledge of selling points structure.

Ipsos and Experian joined there teams and resources to handle this project and to put together available information:

Structural data among titles and distribution network as:

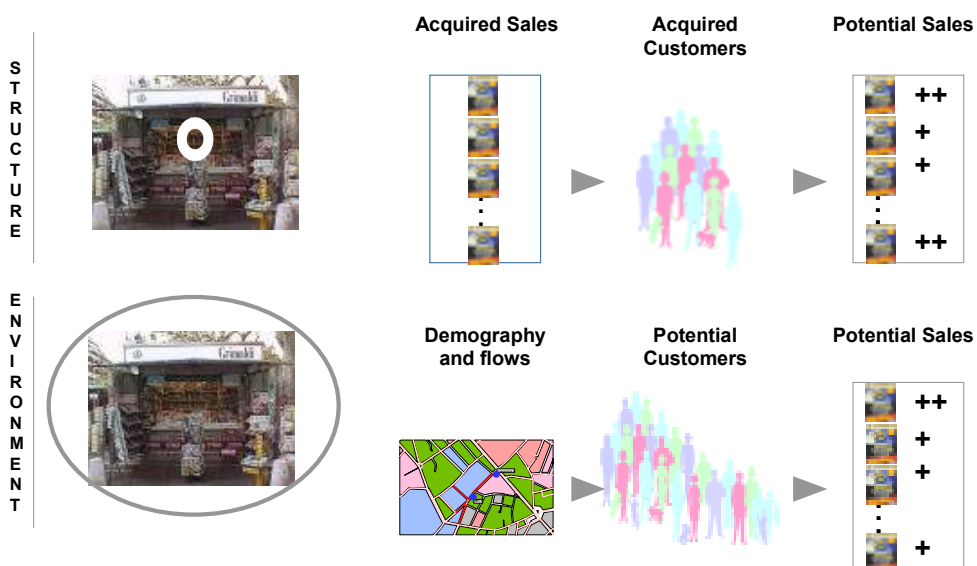
- Selling point profiles (NMPP)
- Sales statistics by titles and shops (NMPP)
- Audience profiles of primary readers (AEPM)

Environment data about population

- Residential population (INSEE – Experian)
- By passing population (Experian – Affimetrie)

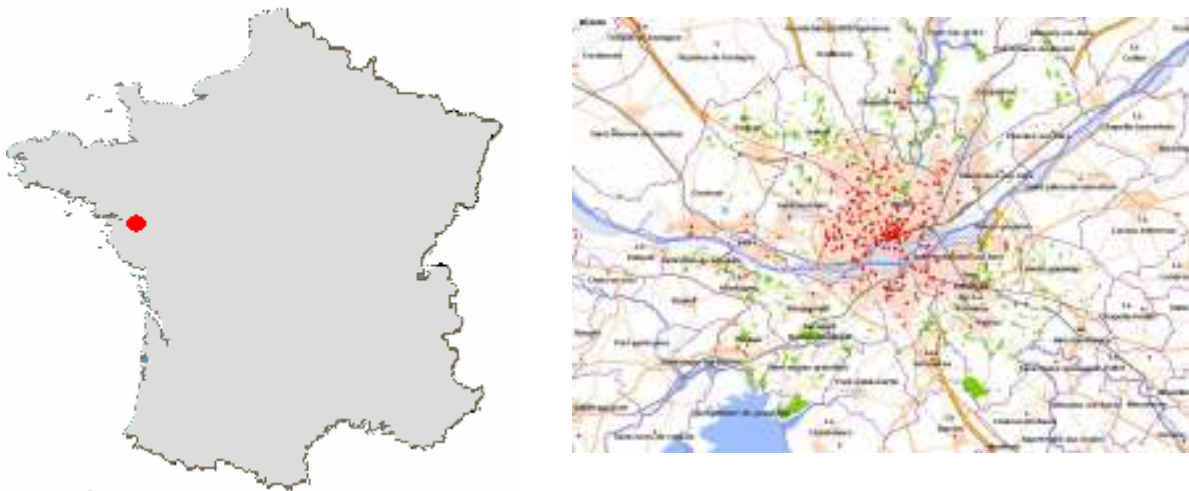
Réseauscopie has the following objectives:

- quantify the number of customers of a given print selling shop and describe these customers in terms of demographics, consumption habits and lifestyles,
- assess, for each magazine and each shop, how much more copies could be possibly sold to the customers already coming to the shop,
- assess, for each magazine and each shop, how much more copies could be possibly sold to new customers, either from the surroundings of the shop or from the by passers.



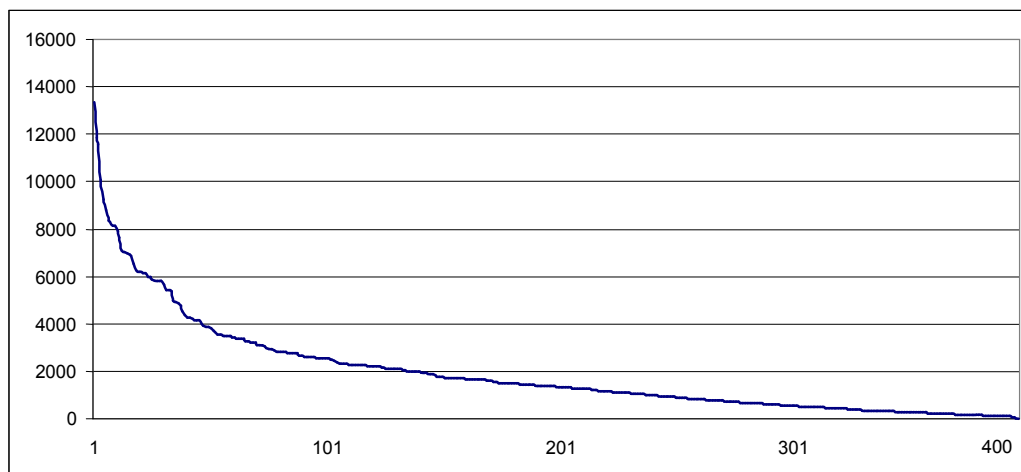
On this paper we will focus on the model that associates sales to customers, and usages that can be found with it.

To apply and test results of the model, we set up a real size simulation by using sales and profiles of a specific area.



Nantes has been chosen for this experience, as it is a large city with representative distribution network and population, and good access to information on selling point level. Dispatched on nearly 400 selling points, magazines sells varied in there proportions and volume as shown hereafter.

Dispatching of selling points size in terms of monthly sales



As for the size, the distribution of titles and categories are very different from one shop to another, due to their customers and the place they are situated.

If TV magazines and Women’s magazine show the highest share in average, some smallest categories like News, Men’s or young’s can reach between 20% to 30% share of voice in some selling point, meaning a wide range of customer’s structure among all of them.

The other element strongly impacting this customer structure, is share of voice of titles inside categories which have each others some fairly different target mostly in terms of age, activities and social level of their customers.

Looking at those two points, we knew that Reseauscopie would be able to found a wide range of profile and specific actions to adapt for optimising sells on their focused targets.

Categories	Mean	STD	Min	Max
	%		%	%
Télévision	51,3	13,9	3,8	78,2
Women's	15,6	5,0	4,3	49,8
People	11,0	4,5	1,4	47,1
News	7,9	4,9	0,9	37,2
Sport	3,0	1,8	0,2	21,1
Cars	2,8	1,7	0,3	15,7
Men's	2,0	2,7	0,1	21,2
Young's	1,6	2,5	0,1	29,8
Home and Garden	1,4	1,5	0,1	17,6
Healthcare	1,1	1,4	0,1	13,8
Sénior's	0,8	1,0	0,1	11,8
Electronic leisure	0,8	0,8	0,0	10,1
Family	0,7	1,0	0,0	9,0
Science and knowledge	0,6	0,7	0,0	6,3
Cooking	0,6	0,6	0,0	4,8
Economy	0,6	0,6	0,0	4,9
Travel	0,4	0,4	0,0	4,1
Photo Cinema	0,4	0,5	0,0	3,0

The AEPM survey

Customers information basis is issued from the National Magazine Readership Survey – AEPM , which carry along the year 20.000 interviews face to face , covering around 160 titles. The identification of “readers by issue’s purchase” in opposition to “readers by subscription” is done through the source of copy question.

The “Source of copy” question in the AEPM survey, tells us for all readers and there magazine, whether the magazine was bought by the interviewee or someone of his household .

This question is formatted as follow :

“Last time you have read or pass through How did you get it ?

- You are a subscriber or somebody else of your household is
- You bought it or somebody else of your household bought it
- You have it at your disposal in your company by subscription or other
- Other source of copy “

In fact we can identify through this question , readers who are reading a magazine:

Purchased for themselves , by themselves or by other people of the household

Purchased for all the household (including themselves), by themselves or other people of the household

In both cases, the matter is to identify readers of a purchased issue who is the final target of the selling points.

The underlying rational for the methodology is basic. Each AEPM interviewee will be ascribed a new weight, in order for the AEPM magazine purchase structure resulting from this reweighting to match the selling structure of the selling shop. Thus, for each selling point, a new weight vector is calculated, covering all AEPM interviewees.

We now describe in more detail each step of the calculation.

1st Step - Computation of the average number of copies bought

APEM allows one to compute how many copies of a magazine an interviewee will buy during a given period. The reference period use for the calculations is the month. There are two stages in the computation:

Answers to source of copy, are transformed into probabilities, using a logit model. Explanatory variables in the model are: sex, age (5 categories), interviewee's occupation (9 categories), education level (4 categories), number of people in household (3 categories), less than 15 years old child in household, head of household, housewife, responsibility for buying and habits of reading..



For each interviewee, one can then compute, for each publication, the average number of copies bought within one month.

One should be aware that the question on buying is filtered by the twelve months readership question. Thus the computed probability is in fact a conditional probability, conditional to the 12 months readership. In the following stages, it will be used as a non conditional probability. The resulting bias is evidently very small.

2nd Step - First reweighting of the interviewees

The aim of this first reweighting is that, for each publication, the reweighted number of copies bought according to APEM is equal to the number of copies sold in the selling shop. This is done separately for each selling shop. Its is a classical reweighting: the objective function is quadratic and minimizes the difference between the initial weight of the interviewee in APEM and his final weight, under equality constraints linking, for each publication, the APEM purchases and the sales of the selling shop.

Each equality constraint is associated with a Lagrange multiplier, which are obtained by a simple regression and the weight of each individual can be easily deduced from them. Before the calculation, it is necessary to normalize the initial weights, by multiplying them by the ratio of total sales of the selling shop to total purchases in APEM.

Let us stress the following:

- this stage is rather computationally heavy: for the Nantes test, 453 reweightings were computed, with 19 120 interviewees of the APEM survey and 104 constraints.
- one could think of another objective function for the reweighting than the distance between initial and final weight. Indeed, there is no reason why the customers of a given selling shop should be representative of the total population. Other objective functions were tried and none of them gave better results than the one used finally.
- the estimated sales at the level of the selling shop are not equal to the observed sales. Some are larger, others are smaller. This latter case raises a difficulty. Customers in a given selling shop obviously buy more than the sales observed in that selling shop, because they don't buy in only one shop. This is the rationale for the second reweighting.

$$\sum p_i \left(\frac{w_i}{p_i} - 1 \right)^2 + \sum \lambda_k (Achats_k - Ventés_k)$$

3rd Step - Second reweighting of the interviewees

The obvious way to solve the problem would be to optimize the objective function of the reweighting under inequality constraints, instead of equality ones: the estimated number of copies bought by the customers should be higher than the observed sales of the selling shop. This however would be extremely time-consuming, when the aim is to process the information for hundreds of selling shop. Thus, we had to look for an heuristic way of dealing with the optimisation problem.

The underlying idea here is that a Lagrange multiplier which is associated with a non saturated constraint (Estimated sales smaller than real ones) is negative. In order to improve the result of this first reweighting, while staying close to the optimal solution found in the first stage, the algorithm seeks for new values for the Lagrange multipliers around the initial values: it will decrease the absolute value of negative multipliers, when the constraint is saturated, and increase it in the other cases.

This is done on a 25 five points grid, with a 0.1 step. Several grids have been tested for that stage. The algorithm stops when all - or almost all - constraints are saturated.

This second reweighting leads to largely better results: the constraints are saturated - estimated number of copies bought larger than observed sales - for 90% of the selling shops. This stage is also quite demanding in terms of computing resources.

Each interviewee has now been ascribed a new weight for each selling shop. Using these new weights, one can split the population of customers along the lines of any question in the AEPM survey: standard socio demographics like sex or age of course, but also income, owners of satellite dish or football addicts...

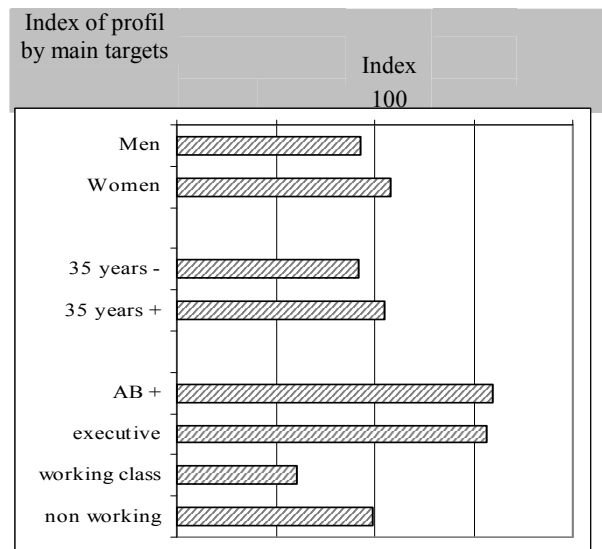
Results obtained at the 3rd step, allow to describe profile of each selling point customers.

Here is some examples showing effect of sales by categories or by titles, to influence volume and profiles of their customers.

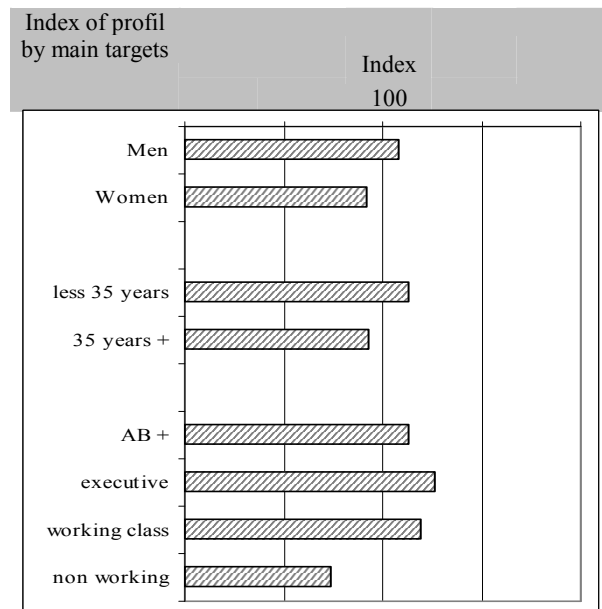
Tables are showing share of voice of categories and titles in the selling point, in comparison with the one in total Nantes area.

Graphs are showing index of structure by target, based on index 100 for average Nantes magazines customers/selling point.

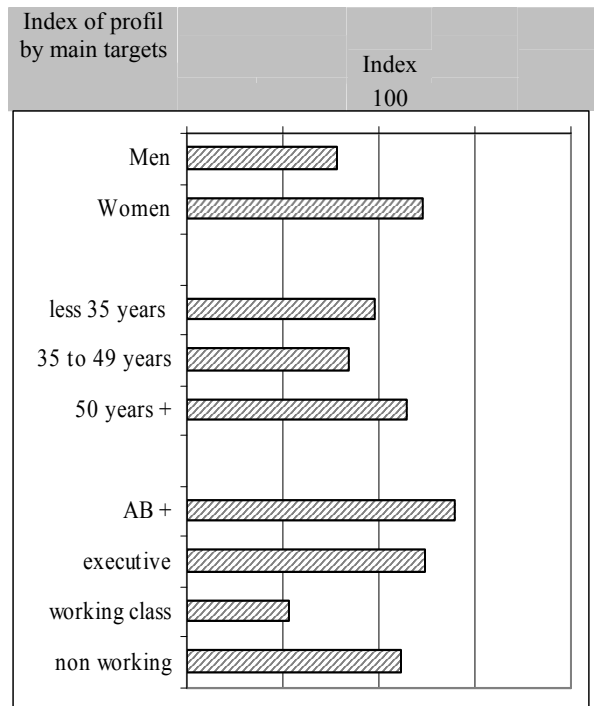
Selling Point 1	Share in the selling point	Share in total Nantes Area
	%	%
<i>Categories and titles</i>		
Cars	3,7	2,8
Women's	15,8	15,6
Femme Actuelle	3,4	6,9
Elle	2,3	0,7
Marie Claire	1,5	0,5
Biba	0,7	0,3
Cosmopolitan	0,7	0,2
Nous deux	0,2	2,2
News	23,4	8,4
Figaro Mag	6,5	1,5
Paris Match	5,5	2,6
l'Express	3,9	0,8
Nouvel Obs	2,1	0,6
House and Garden	3,4	1,4
People	4,3	10,7
Sport	4,1	2,6
Télévision	32,7	50,1
Telarama	4,7	1,5
Télé Loisirs	4,5	11,2



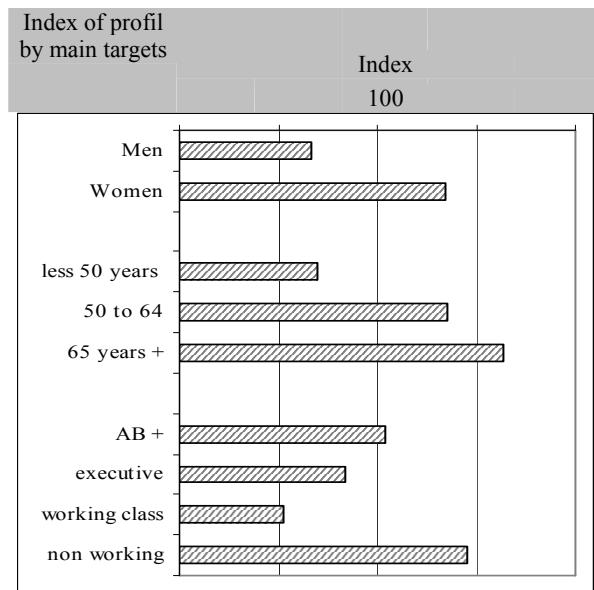
Selling Point 2	Share in the selling point	Share in total Nantes Area
	%	%
<i>Categories and titles</i>		
Young's	1,8	1,1
Cars	4,7	2,8
Auto Plus	2	1,7
Moto Journal	1,6	0,2
Women's	13,5	15,6
News	23,4	8,4
Figaro Mag	1,1	1,5
l'Express	1,1	0,8
Marianne	0,9	0,7
Nouvel Obs	0,2	0,6
Electronic	1,0	0,8
Men's	2,0	1,5
FHM	0,4	0,2
Echos des Savanes	3,0	0,1
Men's Health	2,0	0,1
People	7,1	10,7
Sciences Knowledge	0,4	0,7
Sport	3,4	2,6
Télévision	54,1	50,1
Tele Star	14,9	9,8
Télé Loisirs	13,8	11,2



Selling Point 3	Share in the selling point	Share in total Nantes Area
	%	%
<i>Categories and titles</i>		
Cooking	1,8	0,5
Economy	1,1	0,6
Women's	17,9	15,8
Femme Actuelle	4,6	6,9
ELLE	2,7	0,7
Marie Claire	1,3	0,5
Nous deux	0,4	2,2
News	14,1	8,4
l'Express	2,1	0,8
Courrier International	1,3	0,8
Nouvel Obs,	1,5	0,6
House and Garden	3,1	1,4
Science knowledge	1,6	0,7
Télévision	36,7	50,1
Télé 7 jours	6,4	8,9
Télé Loisirs	6,4	11,2
Telerama	4,9	1,5
Travel	1,1	0,3



Selling Point 4	Share in the selling point	Share in total Nantes Area
	%	%
<i>Categories and titles</i>		
Young	0,4	1,1
Cars	1,5	2,8
Women's	17,9	15,6
Femme Actuelle	7,6	6,9
Gala	2,4	1,8
Elle	1,6	0,7
News	16,4	6,4
Figaro Mag	6,8	1,5
Paris Match	5,2	2,6
l'Express	1,6	0,8
Nouvel Obs	0,8	0,4
People	9,6	10,7
Point de Vue	4,4	1,2
Télévision	45,8	50,1



4th Step - Estimation of possible additional sales

Three types of possible additional copies can be computed:

- **additional copies sold to people who are already customers** of the shop. The difference between estimates sales and observed ones gives an estimate of the additional sales that the selling shop could possibly make. Note that these are not necessarily overall additional sales: part of them would come from cannibalisation between selling shops, some of them gaining sales and others losing.
- **additional sales to people living around the selling shop.** Experian knows, for each selling shop, the number of people around, with some socio demographics details: sex, profession, ages, market size. Crossing these variables, one can compute probabilities of buying on each cell resulting from the crossing. This leads to an estimate of additional copies to sell to near by living would be customers.
- **additional sales to by passers.** In the same way, Experian has some information on the number of individuals commuting around the selling shop, with even more specific details: sex, profession, age, market size, education level, marital status, responsible for buying. The additional copies are then calculated in much the same way as previously.



Specific case for estimation of sales for a new publication

Réseauscopie also allows its users to compute the sales that can be expected from a new publication at the level of the selling shop. The first step for that is to compute probabilities of buying. This can be done via an ad hoc survey if the publication is too young or small to be included in the reference audience survey.

Sales to people who are not yet customers of the selling shop are computed exactly in the same way as for additional copies of an existing publication. The estimation of sales to customers of the shop requires to compute the number of customers of the selling shop. This can be done by using the weights corresponding to that selling shop, combined with the probability of coming at least once in a month in the selling shop.

Some results on potential sales by titles

To illustrate optimisation of numbers of copy sold, we followed our analysis on Nantes, and select several selling points with details on titles to understand how fine can be the adjustment of distribution levels.

We will focus on the “acquired customers” and their additional potential first.

As an indicator of action to set up, the number of current unsold copies allows to choose among different types of actions.

In case of high potential and high level of unsold copies for a magazine you may act on organisation and visibility. This includes advertising on the selling point, but also choosing to put a pile of this magazine nearby the cash desk.

In case of high potential and low level of unsold, you may increase the amount of copy available in the selling point.

In case of low potential and high level of unsold, you can reduce the number of copies available in the selling point, reducing by the way costs of stock.



Selling Point 1	Categories	Titles	Number of present sales	Total customers potential	Potentiel index	Number of current unsold copies
	Cars	Auto Journal	30	65	***	12
	Cars	Auto Moto	15	30	***	4
	Cars	Automobile M	12	29	***	6
	Cinema	Studio Magazine	25	31	*	7
	Economy	Capital	35	60	***	14
	Electronic	Micro Hebdo	24	58	***	12
	Men's	Men's Health	10	14	*	12
	Men's	F H M	15	20	*	13
	News	Le Point	100	125	**	36
	News	l'Express	96	134	**	60
	News.	Nouvel Obs.	88	130	**	48
	Science knowledge	Ca m'intéresse	11	37	***	11
	Sport	Equipe Magasine	192	236	**	56
	Télévision	Telerama	228	269	**	44
	Travel	Géo	29	62	***	30
	Travel	National Geograp	12	24	***	16
	Women's	20 ANS	16	23	**	7
	Women's	Avantages	37	60	**	21
	Women's	Biba	36	43	*	13
	Women's	Elle	128	163	**	32
	Women's	Marie Claire	66	83	**	29

Selling Point 3	Categories	Titles	Number of present sales	Total customers potential	Potentiel index	Number of current unsold copies
	Cars	Auto Plus	72	171	***	28
	Cinema	Studio Magazine	48	60	*	17
	Cooking	Cuisine Gourmande	13	47	**	6
	Cooking	Elle à Table	18	30	**	4
	Economy	Capital	65	83	*	20
	Family	Enfant Magazine	15	23	**	13
	Family	Famili	17	22	*	11
	Home and garden	Elle Décoration	19	35	**	6
	Men's	F H M	29	34	**	16
	Men's	Men's Health	11	16	*	24
	News	Courrier International	112	138	**	36
	News	Le Point	88	116	**	44
	News	l'Express	92	139	**	48
	Senior's	30 millions d'amis	6	30	***	11
	Senior's	Ami Jardins Maison	11	22	**	22
	Sénior's	Pleine Vie	19	22	*	12
	Sport	Equipe Magasine	108	135	**	24
	Woman's	Cosmopolitan	38	49	**	19
	Women's	20 ANS	35	44	**	10
	Women's	Avantages	64	80	**	25
	Women's	Biba	47	56	*	17
	Women's	Elle	144	184	**	28
	Women's	Femme	10	13	*	10
	Women's	Marie Claire	69	89	**	11
	Women's	Marie France	31	40	*	10
	Women's	Prima	80	99	*	16
	Young	Echo Des Savanes	12	25	**	4

A test is actually in work on Nantes area, concerning mostly women's magazines. The aim is to follow instructions obtained by the model, and act at each selling point level to adapt numbers of issues available. The distribution network will use this model for 5 months and conclusion will be available end of then year. We are actually working on the settlement of a national system, that should take place in 2004.

Using customer's profile to build advertising campaign in selling points

An other use of this customer information is to know about the selling point as a place of advertising. Distribution network can use every selling point as a media to cover all population, or a specific target depending on the communication contents. This can wear different forms, as posters, special offers, focus on specific titles or articles, information for launch of new magazines...



Comparing the effect of two main network of advertising in selling points "Dynapresse" and "Passion Presse" each of them covering 35 selling points, this allow a global cover of 16% or 10% of the total city magazine's customers.

If a specific offer have to target "High Income customers + 45.000 €/year" or "Young customers 15-24 years old", using a maximum of 35 selling points, each operation can reach more than 30% of their total targets.

This way, one can set up easily a "selling point-planning" as we use to do "media planning" for advertising about magazine's sales.

Optimization of the targeting (on a base of 35 selling points)

	Customers	% of city customers
Dynapresse	37.300	16%
Passion Presse	22.530	10%
High Income + 45K€	6.900	36%
Young 15-24 years	13.900	30%

Customer attitude in selling points

The National company for press delivery in selling points (NMPP), has just carried in 2002 a survey among customers.

The aim was to get information about habits and process of buying newspapers and magazines.

Main conclusions show that profiles of customers are close to the national population, even if youngest are less often intending to buy some "pre selected" titles.

Frequency of visit to selling points is high among customers :	23%	every day or nearly
	23%	3 or 5 time a week
	43%	1 or 2 time a week

and their fidelity also as they are used to go in average to 2,1 different places, within 33% only one and 42% several but with a preferred selling point they use to go.

If potential is a real deal for publisher, it's because they know that the customers compoment allows to have impulse in press buying process. Before getting to selling point, a customers mostly know in advance what he is looking for. And this is balanced this way:

32%	newspapers	13%	women's
20%	television	13%	news
13%	sports and leisure	...	

But on the bases of some intentions, you may add non intended magazines and this is decided only facing the offer. 24% of the women's magazine's purchase were not intended, 27% of the news, and only 13% for television programmes.

Those conclusions reinforce the will of editors to work on the optimization of sales with Reseauscopie.

