

Sizing & Allocation in Labour Market: business strategies and multivariate analysis

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Research objectives

The aims of this study:

- to offer a possible solutions for companies to solve the Sizing & Allocation problem for new resources after the launch of a new product
- to propose different scenarios in quantitative terms hypothesising marketing strategies
- to identify some under estimated geographical territories using data from internal and external sources where the new hirings will be placed

This study is the result of a collaboration of the Bicocca Applied Statistics Center (B-ASC) and a private company requesting a new rule based on a statistical indicator for reorganize their employees.

The framework

The Bicocca Applied Statistics Center (B-ASC) aims to promote the application of statistical methodologies within private companies and public organisations.

In particular, this collaboration aims to offer different scenarios for representatives' activity, representing the most appropriate models to satisfy both the company's needs and its competitiveness within the reference market.

The term "scenario" is here intended as a possible re-allocation of the workforce following a change in the marketing strategy.

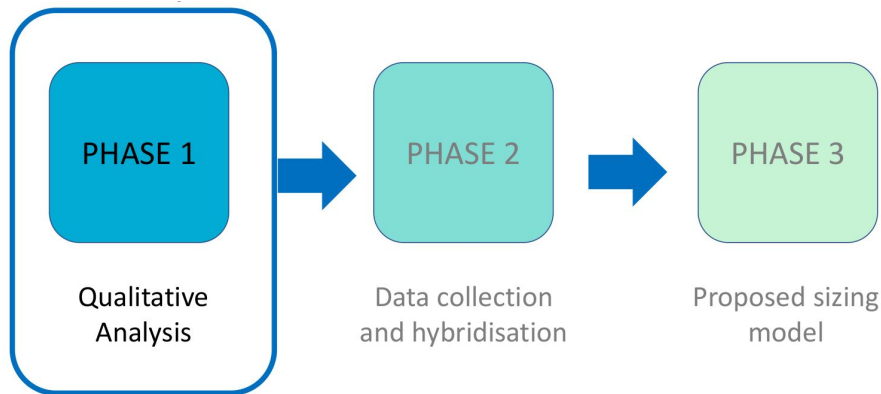
Some internal business data will be compared to Open Data, considering the type of subject of interest, the market dynamics and the prescriptive potential

Methods

To achieve the goal, a three-phase plan was designed:

- 1 Individual interviews with company managers involved in the strategic and operational management of the markets.
- 2 Data collection and hybridisation of health open data and company's internal data.
- 3 Development of the sizing model through the synthesis of indicators and weightings of both the actual and potential effort in terms of promotional pressure. Indices of territorial potential may be applied to define contiguous and/or nested areas, if appropriate.

Activity Stream



Qualitative Analysis

Individual interviews with company managers involved in the strategic and operational management of the markets. A semi-structured interview was used to understand the company's needs and collect information to define possible scenarios and the following main evidences:

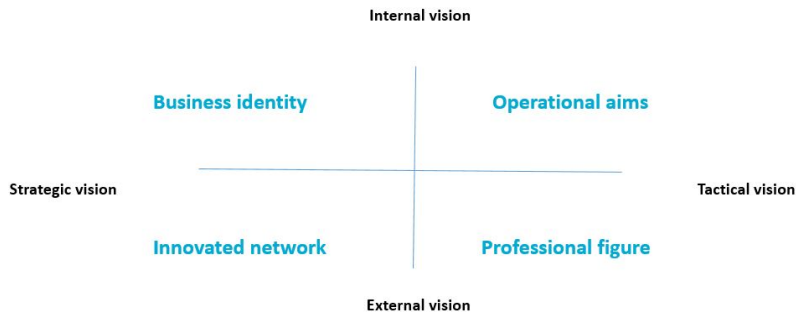
- The effort required from the company appears blurred between the global and local vision. It is important to be able to integrate local needs with global strategies
- The arrival of new products may be an opportunity for change, in view of a new product launch, the interviewees agree on rethinking the presence on the territory.
- This may happen by acting on the mix of products on offer or on the sales force
- A meeting point must be found between the company's revenue and the working efficiency of the employees

Qualitative Analysis (2)

- All the interviews have been analysed to achieve the key concepts and obtain a multi-perspective vision of the company
- Term frequencies has been considered to build a dictionary as a Text Mining technique
- From a detailed analysis of the interviews, the main concepts have been extracted
- The dictionary allows to obtain a quantitative variable, and for supporting the conceptual analysis, a PCA has been applied on these data

Qualitative Analysis (3)

From the PCA, two components explaining the 74% of the variance have been extracted.



The qualitative analysis represents the starting point for the choice of the selected KPI for the quantitative analysis.

Data hybridization

A database containing quantitative indicators has been collected mixing internal and external to perform the sizing and allocation model

Internal data are classified into two macro-categories:

- 1 sales data: they include data about revenue of the products present in the market
- 2 call report data: reports showing the daily activity of the employees

Information is gathered from two external data sources:

- 1 Health for All data: a data-warehouse about healthcare indicators released by Istat
- 2 demographic data: population indexes and birth rate

Quantitative analysis

- The hybridization of these sources led to a structured dataset where each row represents an Italian geographical area. The used territorial classification is NUTS 1, NUTS 2 and NUTS 3
- The variables for the definition of the potential have been divided into three categories: structural, market and promotional pressure
- In order to make assumptions about the capacity of a new team to determine the correct sizing, some hypothesis about the number of working days have been assumed
- The potential portfolio has been computed only by considering the definition of the total number of physicians in portfolio and computing a number of visits for day

The S&A model (Sizing)

- The final Sizing model has been obtained through the potential portfolio, the number of physicians and the working days
- The previous capacity in the workforce was based on the daily visits, now with a launch of a new product, it is necessary to re-size the number of employees adding different specializations among the physicians
- The original composition of the team was made of 112 employees. Using the proposed Sizing model, the new team is composed by 132 elements, with a differential of +20

The S&A model (Allocation)

- Once the Sizing phase is completed, the Allocation phase allows to arrange the new resources in the Italian geographic area considering NUTS 1 and NUTS 2 units
- An Index of Territorial Potential (ITP) for Area and Region has been computed to detect under-estimated territories using a Principal Component Analysis
- The ITP explains 79% of the variance using the first component of the PCA

NUTS 1	ITP	Actual Employees	Proposed Employees	Differential
North-West	23%	28	32	+4
North-East	25%	32	32	0
Centre	25%	28	32	+4
South & Islands	26%	24	36	+12
Italy	100%	112	132	+20

The S&A model (Allocation) for NUTS 2

- If the Allocation is hypothesized for NUTS 2, the ITP could be also computed for Italian regions

NUTS 2	ITP
Lombardy	18.1%
Lazio	10.4%
...	...
...	...
Aosta Valley	0.1%
Molise	0.1%
Italy	100.0%

- Lombardy is the region with the highest ITP, this means that in North-West area, possible new hirings could regard this region
- Similar considerations could be hypothesized for NUTS 3 units

Conclusions

- This study allowed to propose an exploratory approach to determine the number of new hirings using a S&A model based on a qualitative and quantitative analysis
- A PCA related to the terms used during semi-structured interviews to the managers allowed to visualize possible marketing strategies
- Hybridization of business and external sources led to a creation of a database in which a second PCA involving selected KPI about structural, market and promotional pressure obtaining the ITP
- ITP showed the South & Islands area was detected as under-estimated, so the majority of new hirings could be allocated in this area. For NUTS 2, Lombardy is the region with the highest ITP
- Future works could regard similar analysis conducted on other companies in different economic sectors to verify the goodness and the applicability of the S&A model