How to become a pastry chef:
a statistical analysis through the company requirements

Paolo Mariani, Andrea Marletta

1. Introduction

During the last years, the competitive context in which the firms are involved is definitely changed. The managers work in dynamic markets, characterised by unpredictable and complex phenomena. The companies are rapidly involved in changing processes where the available capabilities of the organisation represent a key point for success. This led to a flexible organizing model where new professional and relational competencies are emerging. In 2017, the OECD stated that sectors and nations may take advantage of better management of skills (Grundke et al., 2017).

In this study, the attention is focused on the labour market in the food & beverage sector, in particular the requirements are considered for two job profiles: pastry chef and pastry assistant. A key question is which are the requested competencies searched by the companies to hire these figures and which are the requested differences between the two roles?

The role of soft skills has increased its importance compared to the hard ones guaranteeing a competitive advantage to for the success of a company. They are transversal skills necessary to have success in the job market. This is why in this study, soft skills are considered together with the candidate's previous experience, the age and the knowledge of a foreign language. Hard skills are related to the knowledges and technical competencies useful for a specific role, while soft skills are relational and personal capacities. For this reason, they are more difficult to define and measure, and since they are not related to a learning method, it is more complicated to acquire them. According to the Excelsior informative system and by considering all the job positions, the most requested soft skills are: autonomy, flexibility, adaptability, ability to communicate, problem solving and team working (Unioncamere, 2017).

In relation to the area of interest of the study, in a pastry shop the hard skills are represented by the capability to know recipes and to use the pastry tools, while the soft skills could be intended as the goodness to satisfy the customers or the availability towards the colleagues. The pastry shop market in Italy is a key industry for the food & beverage economy because it represents an example of excellence in the world. It is a sector in expansion in which the quality of the product is going to increase thanks to education and technology. It is a growing market ready to satisfy the new requests of category of intolerant people (lactose free, gluten free, ...) and particular attention to the biological products.

In Italy, there are about $40,000$ pastry and ice-cream shops with almost $100,000$ employees. The 32.7% of these shops has $4-6$ employees, and the 47% has $2-3$ employees. Pastry shops are more spread in the North and Centre Area, while ice-cream shops are in the South Area. There is no significant difference in the distribution of employees between North and South area.

The paper is structured as follows: after the introduction, a second section is dedicated to the methodologies used to answer the research objectives. A third section will show the description of the dataset and some preliminary results. Finally, conclusions and future works will follow.

Paolo Mariani, University of Milano-Bicocca, Italy, paolo.mariani@unimib.it, 0000-0002-8848-8893
Andrea Marletta, University of Milano-Bicocca, Italy, andrea.marletta@unimib.it, 0000-0002-4050-5316

2. Methodological tools and data description

This study has several aims: first, to detect a possible relationship between the age of work experience and the possibility to hire as a pastry chef or a pastry assistant taking into account a set of possible skills; second, to detect whether the age of a candidate could represent an obstacle or an advantage in the hiring process; third, to find a classification of the analysed soft skills.

Two methodological techniques have been principally used in this study to answer these issues: logistic regression and principal component analysis. The logistic regression is a common statistical model in presence of a binary response variable. In particular, this tool could allow to answer the first two research objectives hypothesizing a model in which the binary response is the category to be hired (pastry chef or pastry assistant) and the explanatory variables are the age of previous work experience, the knowledge of a foreign language and some features of the pastry shop. To pursue the last issue, a principal component analysis has been applied on a set of soft skills to make a classification in two different groups.

Finally, the results from these two approaches are used to distinguish the figure of a pastry chef from a pastry assistant based on age, previous work experience and a set of soft skills.

Data for this analysis were collected by The AdeccoGroup in Italy in 2016 and 2017. The personal competencies needed to face the growing flexibility of the profession are the subject of specified request cross-sectional to more economic sectors. Data contain information classified on nine sectors: IT Digital, Engineering, Pharmaceutical, Finance, Tourism, Human Resource, Commercial, Food & Beverage and Production. In particular, the dataset involves about $220,000$ job position and 43 job figures. Among these figures, the selected ones are referred to the pastry shops in the Food & Beverage sector: pastry chef and pastry assistant.

The figure of pastry chef designs and creates sweets and cakes, plans and organizes candy in hotel, restaurants and pastry shops. The activities include the preparation of recipes, the estimate of costs for feed supplies, the quality monitoring of the product, the supervision and coordination of other chefs activities, the control of the equipments and the recruitment of the pastry assistants. The pastry assistant prepares ingredients, washes the dishes, cleans the common spaces and develops other tasks in support of the pastry chef. The activities contain the kitchen's cleaning, the control and the conservation of the ingredients and the preparation of simple products. It is possible to note that the two figures are hierarchically connected performing tasks at different levels, for this reason it may be expected that they have different soft skills.

The used dataset for the analysis contains information related to 76 job offers for the two professional figures and the features of the subjects that has been hired, 10 pastry chefs and 66 pastry assistants. For these subjects, information is available at the candidate level about gender, 43 women (57%) and 33 men (43%), date of birth, previous work experiences and at job offer level as company dimension, requested language and soft skills.

About the previous work experiences of the candidates, it has been expressed in terms of number of months and it involves both experiences pertinent or not to the food & beverage sector. The company dimension is categorized on three levels based on the number of employees of the company according to an internal classification of TheAdeccoGroup. The list of soft skills requested to be hired in the pastry shop is available for each job offer. To reach the purpose of this analysis, 12 dummy variables (one for each soft skill) were created with value 1 in case of presence of the competence in the job offer and 0 otherwise.

On 76 job offers, the 12 soft skills are:

1. Self-control (36.8%)
2. Customer orientation (15.8%)
3. Learning and innovation (13.2%)
4. Autonomy and initiative (13.2%)
5. Quality orientation (11.8%)
6. Team Working (11.8%)
7. Communication (10.5%)
8. Adaptability (7.9%)
9. Participation and responsibility (6.6%)
10. Impact and influence (6.6%)
11. Motivation (2.6%)
12. Planning and organisation (1.3%)

where the value in brackets is the percentage of presence of the competence in the job offers, these means the self-control is the most requested competence desired in 28 of the 76 cases. Customer orientation is requested in 12 job offers, at the third place, learning and innovation and autonomy and initiative in 10 job offers

If a sum of the soft skills is provided for job offer, as expected a number of higher skills is requested for the pastry chef, since it is a role of superior degree. On the other hand, the number of requested skills seems to be independent by the company dimension.

3. Principal results

A logistic regression gives the possibility to detect a relation between a set of explanatory variables as the length of the previous work experience (expressed in month), the age of the candidate and the job position:

- 0 for the professional figure pastry assistant
- 1 for the professional figure pastry chef

Considering a 95% confidence interval, the only variabile with a β coefficient different from 0 is the age of the candidate. $\beta = 0.132$ and $exp(\beta) = 1.141$, this means that for each year of age the probability to be a pastry chef is 1.14 times respect to a pastry assistant. The number of requested languages, the dimension of the company and the length of the previous work experience (expressed in month) did not seem to have an impact on the hiring between the two professional figures.

The second technique presented here is the Principal Component Analysis (PCA), usually applied to reduce the space of dimensions (Jolliffe, 2002). In this case it is used to group the set of 10 soft skills, Motivation and Planning and organisation have been deleted because of low frequencies. The number of components here chosen is 3 explaining 75% of the variance. Once established the number of components, a Varimax rotation was applied to the components matrix, in order to improve the interpretation of the three groups. In table 1, the classification of the soft skills is presented.

Group 1: Efficiency	Group 2: Outward	Group 3: Synergy
Quality orientation	Customer orientation	Team Working
Learning and innovation	Communication	Self-control (-)
Participation and responsibility	Adaptability	
Autonomy and initiative	Impact and influence	

Table 1: Classification of soft skills using PCA, 2016-2017, Italy

The first group classifies soft skills more tangible and related to the product as the quality orientation, so it may be named Efficiency. The second one relates to competencies towards others like customer orientation and communication, for this reason this group may be named Outward. The last group is positively correlated with team working and negatively correlated with self-control and it is called Synergy.

4. Conclusions

The present study aimed to underline the importance of soft skills as a requested requirement in the job market for a successful job career. Using the AdeccoGroup dataset on job figures, a detailed study was conducted to investigate the food & beverage sector and in particular the pastry shop field. The application classified some desired features for candidates hired as pastry chef and pastry assistant in Italy in 2016 and 2017.

The most interesting result is about the presence of different soft skills and the influence of age and the previous work experience in the two job figures. As it is possible to expect from a hierarchical point of view, the oldest candidates with more experience are addressed to the figure of pastry chef, while the youngest ones or the least experienced candidates are more desired as a pastry assistant. Another important expected result is that the pastry chef requests a higher number of soft skills than to the pastry assistant. For the pastry chef figure, the most requested soft skills are: autonomy and initiative, quality orientation and learning and innovation. On the other hand, for the pastry assistant figure, the desired soft skills are: self control, team working and customer orientation. Finally, an additional classification allowed to divide the set of soft skills in Efficiency soft skills, Outward and Synergy soft skills.

Future works could considering other explanatory variables in the logistic regression model to detect the influence of other factor in the choice of a new hiring between the two figures. Moreover, a similar analysis could be conducted on other job figures to confirm the soft skills classification in the three groups detected.

References

Grundke, R., Jamet, S., Kalamova, M., Keslair, F., Squicciarini, M. (2017). *Skills and global value chains*. OECD, Paris.

Jolliffe, I. T. (2002). *Principal Component Analysis, 2nd edn. Series: Springer Series in Statistics*, XXIX, 487. illus. Springer, NY, 28.

Unioncamere. (2017). Sistema informativo excelsior. In Progetto Excelsior. Sintesi dei principali risultati. http://excelsior.unioncamere.net