

Managerial Behaviours in the Italian innovative companies: a case study

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- ① Brief introduction to evolution of the Labour Market and the figure of the open manager
- ② **Materials and methods:** Evidences from a survey and comparison with a self-evaluation
- ③ Application and results
- ④ Summary and Conclusions

Motivation of the study

The labour market is a field in permanent evolution and this is also tangible in the realization of new professional roles or figures.

Such evolution could be defined on the basis of the emergence of new tasks or alternatively it could be derived from a description of some behaviours that managers undertake in the course of their work. In this second case it is possible to talk about of evolution of a professional figure.

This study focuses on a specific professional figure: the manager.

In particular, the main focus is to propose a possible new approach in the managerial behaviour able to define this professionals figure and a first imagine of open manager.

Despite the majority of managers performs the same tasks, their behavioural approach could be different, for example in the field of interpersonal relationships.

The Open Manager figure

The open manager figure is not actually well defined, so it appears to be as a latent figure. Nonetheless, this concept was enhanced by some authors in combination with the definition of open innovation (da Mota, 2013).

Aim of this study is try to define the features of this professional figure, using a data-driven approach based on a survey. The answers from this survey could outline some emerging attitudes and behaviours.

In particular, the aim of this research is twofold:

- 1 to detect the possible new approach in the managerial behaviour able to define the professionals figure of the open manager, based on some evidence derived from a survey conducted by interviewing a set of managers of Italian companies using a structured questionnaire
- 2 to validate the distributed questionnaire as a classification tool which could be useful for predicting the professional roles or figures of managers based on their reported managerial behaviours.

Cluster analysis from an Open Manager survey

In order to identify homogeneous groups of managers who share common behaviors and attitudes, a 30-items questionnaire were submitted to a non-probabilistic sample of Italian managers.

Each statement represents a possible behaviour of the open manager and it has been formulated as a 4-point Likert scale, with responses ranging from 1 to 4 where 1 stands for "totally disagree" and 4 for "totally agree".

Using these values, an agglomerative hierarchical cluster analysis was carried out using the Ward method.

Once obtained the clusters, the groups were analysed in relationship with the single items of the questionnaire by comparing the answers distribution in each single group with that in the entire set of respondents.

This allowed to locate some discerning items identifying the managers' behaviors useful for defining their openness level.

Latent class model based on self-evaluation

A second part of the questionnaire asked for socio-economic features of the managers, characteristics of the representing company and a self-evaluation about their level of openness on a 1-10 scale.

Using this variables, a Latent Class Regression model has been applied to obtain classes comparable to the clusters. Latent Class Regression model is one of a broader class of Finite mixture Models (Vermunt, 2008 and 2010).

Assume the vector of response ratings y_{ij} with a probability density function f modeled as a finite mixture of G conditional distribution:

$$f(y_{ij}|\pi, x, z, \Sigma) = \sum_{g=1}^G \pi_{g|z} f_g(y_{ij}|x, z, \beta_g \Sigma_g) \quad (1)$$

Cluster membership: manager i is assigned to latent class g via the estimated posterior probability

$$\hat{p}_{ig} = \frac{\hat{\pi}_{g|z} \hat{f}_{ig}(y_{ij}|x, z, \beta_g \Sigma_g)}{\sum_{g=1}^G \hat{\pi}_{g|z} \hat{f}_{ig}(y_{ij}|x, z, \beta_g \Sigma_g)} \quad (2)$$

Data and preliminary results

Data were collected by Fondirigenti and Confindustria in 2020 through the previously mentioned questionnaire distributed to two different sets of Italian companies and filled in by a managerial internal figure:

- 1 a first group was composed by managers of innovative companies: 213 respondents
- 2 a second one was obtained by managers of generic firms: 170 respondents

The total number of respondent was 383 managers from 320 different companies.

The questionnaire was made up of aforementioned two sections and the sample can not considered probabilistic.

Descriptive statistics

The distribution of the responding managers by turnover and size suggests a possible polarisation of the managers.

Revenue/N.of employees	10-49	50-149	150-249	> 250	Total
2-10 million Euro	76	14	1	2	93
11-25 million Euro	11	53	7	93	76
26-50 million Euro	3	34	26	9	72
> 50 million Euro	3	6	22	111	142
Total	93	107	56	127	383

The managers answer about the readiness of their organization for Openness (1-10 scale).

Revenue/N.of employees	10-49	50-149	150-249	> 250	Total
2-10 million Euro	6.3	6.2	6.0	6.5	6.3
11-25 million Euro	6.4	5.3	6.9	7.3	5.7
26-50 million Euro	6.3	5.8	6.4	6.9	6.2
> 50 million Euro	7.0	5.0	6.0	5.9	5.9
Total	6.4	5.6	6.3	6.0	6.0

Results from Cluster analysis

Data analysis carried out define 6 different groups of managers with similar behaviours, based on the responses to the questionnaire items.

Group 1. Guardians traditionalist, defender:

- a) It is always necessary to clarify priorities for the functioning of the team
- b) I feel that I am fond of my colleagues at this company
- c) Sometimes I personally write the procedures that govern activities

Group 2. Leaders:

- a) I don't like employees who can impose themselves on others
- b) It is always prioritize the career development of your employees
- c) Sometimes I do not personally write the procedures that govern activities

Group 3. Selfish people:

- a) Business today doesn't require the most consistency
- b) I don't expect my employees to be able to make changes on their own
- c) I feel that I am not fond of my colleagues at this company

Group 4. Regulators:

- a) I prefer collaborators who can impose themselves on others
- b) Business today requires the utmost consistency
- c) When faced with any critical task, I always know someone who can help me

Group 5. Explorers:

- a) I can accept constant change in the business world
- b) It is important to admit your mistakes to co-workers
- c) In the professional context, I act very quickly

Group 6. Opponents:

- a) I can't accept constant change in the business world
- b) It is not important to admit your mistakes to co-workers
- c) I don't take every opportunity I get to learn new things

Group	N	%
Guardians	76	19.8
Leaders	79	20.6
Selfish	69	18.0
Regulators	67	17.5
Explorers	73	19.1
Opponents	19	5.0

Cluster analysis and self-evaluation

Comparison between the 6 obtained clusters and the self-evaluation openness grade:

Group	Average openness
Group 1: Guardians traditionalist, defender	7.4
Group 2: Leaders	7.2
Group 3: Selfish people	7.5
Group 4: Regulators	7.8
Group 5: Explorers	8.3
Group 6: Opponents	6.3

Source: Bruttini et al., at IES, Innovation and Society, 2022

Looking at the self-evaluation, the Explorers group seems to be closer to the figure of the Open Manager.

Results for the Latent Class regression mixture model

The following model uses as dependent variable the self-evaluation grade about openness and the explanatory variables are the 30 items and three personal variables: age, education level and experiences (in ages).

This model is able to identify new groups of managers associating to each class the most representative items.

As in the Cluster Analysis, the number of the latent classes is not pre-defined but selected using some criteria. According the BIC, the best model detects only 2 latent classes.

The first latent class is composed by 39 managers and on the basis of item most correlated, they will be named "empowerers", they assign responsibility to their collaborators without giving acknowledgements.

The second latent class contains 342 managers, 2 remaining units have been not assigned to any group

Results for the Latent Class regression model

- For Class 1 the Item 4 has a positive effect, Item 13 a negative effect
- For Class 2 lower coefficients related to the items
- Age and Education Level has negative coefficient, managers in Class 1 are youngest and with a lower education level
- Experience effect is not significant
- Latent class 1 has a low self-evaluation of openness

	Latent Class 1		Latent Class 2	
	Estimate	P-Value	Estimate	P-Value
D1	-0,520	0,361	0,584	0,000
D2	-0,626	0,046	0,011	0,944
D3	1,395	0,003	0,242	0,152
D4	3,189	0,070	-0,068	0,813
D5	-1,788	0,001	-0,071	0,568
D6	0,800	0,000	-0,104	0,386
D7	-0,049	0,870	-0,317	0,017
D8	-1,567	0,124	0,070	0,573
D9	-0,345	0,672	-0,240	0,076
D10	1,522	0,185	0,424	0,002
D11	2,977	0,000	-0,153	0,287
D12	0,338	0,332	-0,010	0,933
D13	-3,950	0,000	-0,151	0,299
D14	-0,141	0,805	0,402	0,013
D15	-0,699	0,491	0,083	0,513
D16	1,880	0,002	-0,007	0,964
D17	-0,779	0,302	0,293	0,017
D18	2,615	0,000	-0,140	0,267
D19	-0,438	0,253	-0,051	0,697
D20	0,888	0,079	-0,120	0,328
D22	-0,604	0,371	0,136	0,272
D23	-0,671	0,508	0,080	0,572
D24	0,553	0,285	0,531	0,000
D25	-1,039	0,000	0,239	0,062
D26	-0,328	0,160	0,085	0,529
D27	2,195	0,000	0,047	0,726
D28	-0,367	0,594	0,052	0,663
D29	0,694	0,037	0,280	0,047
D30	-0,865	0,485	-0,232	0,206

Categorical Latent Variables			Self-evaluation openness (average point 1-10 scale)	
	Estimate	P-Value		
Age	-0,086	0,007	Latent class 1	4,9
Education level	-1,492	0,009	Latent class 2	7,8
Experience	0,319	0,794		

Cluster Analysis vs Latent Class Regression Model

- **Managers in groups and classes**
- No direct correspondence between clusters and latent classes
- 33% of empowerers are leaders
- Difference between behaviour and self-evaluation about openness
- **Self-evaluation in scale 1-10 (average points)**
- Group 1 and Group 3 have the maximum difference in self-evaluation

Group	Class 1	Class 2
Guardians	6	69
Leaders	13	66
Selfish	6	63
Regulators	8	58
Explorers	3	70
Opponents	3	19
Total	39	342

Group	Class 1	Class 2
Guardians	4.7	7.6
Leaders	4.9	7.6
Selfish	4.8	7.7
Regulators	4.5	8.2
Explorers	7.3	8.3
Opponents	3.7	6.7
Total	4.9	7.8

Conclusions

- The aim of this paper was to obtain from a survey on Italian managers information about the figure of the Open Manager using two different classification methods
- A cluster analysis has been conducted on the business behaviours detecting 6 possible types of managers
- A latent class regression model based on the self-evaluation grade of openness classified 2 groups of individuals
- There is no direct correspondence between the two classification methods, but some preliminary considerations could be achieved
- A substantial difference is present between business behaviours and self-evaluation in terms of grade of openness
- Future works could focus the attention on other exogenous variables related to the companies