



Particularities of the "Individualism vs. Collectivism" Cultural Dimension in Galati County Business Environment

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ABSTRACT

Starting from the results and determined statistical indicators on data collected as part of the COMOR Project, developed by The Scientific Society of Management from Romania, to characterize managerial behavior in Romanian economic organizations, we have initiated an exploration using data mining techniques. The purpose of this analysis is to investigate whether group cohesion is valued at the expense of individualism attitude, based on the results obtained in this project and the impact that individualism / collectivism orientation has on the behavior of the employees in Galati organizations.

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1. Introduction

As a country has cultural features, traditions inherited and preserved, which must be taken in consideration in cultural relations, economic and political ties with other countries, as an organization has particular characteristics that define organizational culture. Organizational culture is a combination of behaviors, attitudes, ideas, opinions and beliefs, goals, aspirations.

The country scores on the dimensions of national culture are the outcome of the research conducted by Geert Hofstede, in his work "The consequences of culture", published in 1980, developed the first empirical model of "dimensions" of national culture. He identified and defined four cultural dimensions: power distance, individualism versus collectivism, uncertainty avoidance and masculinity versus femininity, the findings are based on opinions expressed by a number of 116,000 people in 56 countries; people have worked for the American multinational company IBM. Subsequently, based on the reaches made by Canadian Michael Bond, was discovered and defined the fifth dimension - the orientation towards the future.

In 1990 Robert J. House initiates research program GLOBE - Global Leadership and Behavior Organizational Effectiveness, investigating areas: financial services, manufacturing, telecommunications services in 60 countries worldwide, including 22 countries in Europe, among which Romania is not was included.

The study of Cultural Dimensions in Romanian Organizations developed by COMOR project is an example of relevant theoretical research, carried out on national level. The study is promoted by INSSE, led by a group of researchers in the field and the results in the field were conducted with the support of professional organizations. The data were collected from all counties, with the participation of local business representative organizations. [Rosca, D., 2011]

The purpose of this analysis is that, starting from the results and determined statistical indicators for Galati county obtained based on questionnaires in this project, to find, using Business Intelligence instruments techniques, relevant information about the individualism / collectivism dimension of the organizational culture, relationships between responses to different survey questions.

2. The Methodology for the study of the characteristics of Individualism - Collectivism Organizational Dimension

Mindmapping technique developed by researcher Tony Buzan from UK offers a landscape view by allowing hierarchical structuring of information.

Using mindmapping technique requires a logical and structured approach, yet stimulating creativity as problem-centered arrangement and hierarchical structuring of ideas inspire the development of new ideas by creating new branches or adding new ideas on the appropriate branches.

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A mind map contains an overview for a lot of information in a confined space. This is possible through the use of key concepts or symbols create by the user himself.

With this method of study we plotted the information obtained by the 1st questionnaire completed by subjects, so for every respondent we can detail:

- Information on professional activities within the organization:
 - o Company details, type of organization, size, capital and employees number detailed by hierarchical levels, gender and age tranches
 - o Indicators: turnover, Net Profit
 - o Information on Customers and Suppliers
 - o Activity field, with details of internal and/or foreign market it operates
 - o core business, technical equipment, position in the local industry, contributions to environmental protection, company slogan
- Personal information, branched by gender, age tranche that fits the subject, marital status, number of children;
- Information on subjects education and training, broken down by level of education and skills on foreign languages;
- Information on the position in the internal hierarchy of the organization;

Information on professional activities within the organization:

We obtain an intuitively image, easy to analyze for the information provided by the 1st questionnaire, which highlights the connections, relationships between ideas, providing an overview represented by Figure 1, allowing quick access to information.

Unlike sequential thinking, the mind map method of analysis highlights the relationships between information, similar to an HTML page that contains references, links to other pages that have links and information derived from the current display.

We can consider that for each subject we build a map containing information from the first questionnaire and the answers to the second questionnaire, each record corresponds to a plan that centers on the interviewed subject and containing his responses to questions, overlapping with other plans and build a data cube.

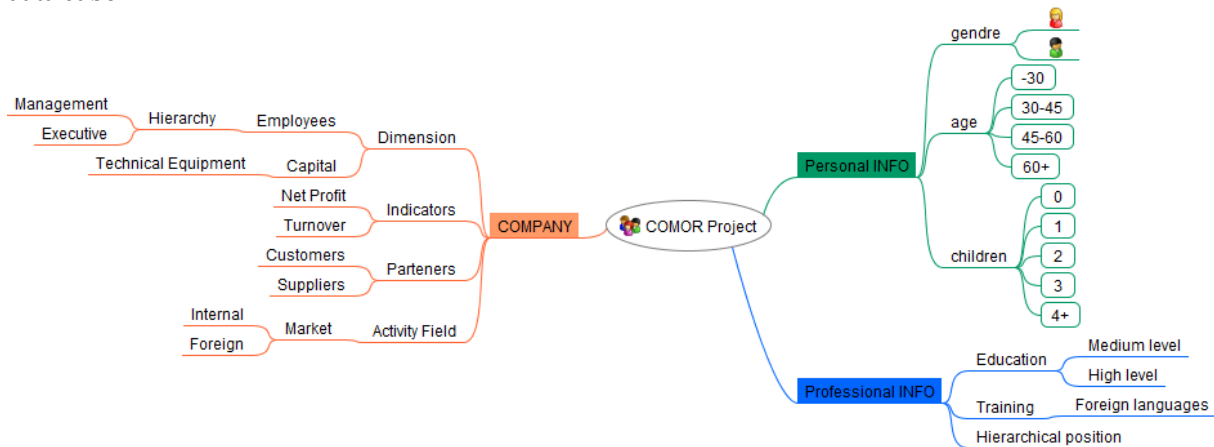


Figure 1. Information about the subject represented by „mind map” technique

Business Information is used to understand business trends, strengths, weaknesses and to analyze competitors and the market situation.

Association Rule was introduced by Agrawal in 1993, in order to analyze a large database containing commercial transaction. An association rule is a logical sentence of the form $A \Rightarrow B$, where $A \cap B = \emptyset$ and A is the antecedent and B represents the rule consequence. Both A and B are subsets of elements from a set of items.

Association Rule is a data mining technique, in order to seek correlations among data, to perform an affinity analysis – “what goes with what”.

Clustering partitions a collection of things (e. g., objects, events, etc., presented in a structured data set) into segments (or natural groupings) whose members share similar characteristics. Unlike in classification, in clustering the class labels are unknown. As the selected algorithm goes through the data set, identifying the commonalities of things based on their characteristics, the clusters are established. Because the clusters are determined using a heuristic- type algorithm, and because different algorithms may end up with different sets of clusters for the same data set, before the results of -clustering techniques are put to actual use it may be necessary for an expert to interpret, and potentially modify, the suggested clusters. After

reasonable clusters have been identified, they can be used to classify and interpret new data, including optimization.

The goal of clustering is to create groups so that the members within each group have maximum similarity and the members across groups have minimum similarity. Firms often effectively use their data mining systems to perform market segmentation with cluster analysis.

Cluster analysis is a means of identifying classes of items so that items in a cluster have more in common with each other than with items in other clusters. Cluster analysis is also used to identify natural groupings of events or objects so that a common set of characteristics of these groups can be identified to describe them.

Association, or association rule learning in data mining, is a popular and well-researched technique for discovering interesting relationships among variables in large databases. Thanks to automated data-gathering technologies such as bar code scanners, the use of association rules for discovering regularities among products in large-scale transactions recorded by point-of-sale systems in supermarkets has become a common knowledge-discovery task in the retail industry. In the context of the retail industry, association rule mining is often called market-basket analysis.

If-then rules represent sufficient conditions (the "if" condition is a sufficient condition for the result). If-and-only-if rules go one step further: they represent necessary and sufficient conditions.

An if-and-only-if rule has the following structure: The dependent variable's value is r, if and only if, the value of Field B is b, or the value of Field C is c, etc. In other words, if the value of Field B is b, or the value of Field C is c, then the dependent variable's value is r; and Field B is not-b, and the value of Field C is not-c, then the dependent variable's value is not-r.

3. Manifestation of the Individualism – Collectivism Size

Cultural dimensions represent common structural elements in cultural systems of the countries based on the fundamental issues that every company responds in a particular way.

The five dimensions are represented by particular values for each country, which define the country score and allow comparison of that size:

PDI = Power Distance

IDV = Individualism vs. Collectivism

MAS= Masculinity vs. Femininity

UAI = Uncertainty Avoidance

LTO= Long Term Orientation

Individualism vs collectivism dimension is determined by the specific answer at the following questions:

- How do members of the same culture relate?
- Who are they loyal to?
- How is stimulated performance?
- How is encouraged freedom of opinion?
- Priority given to the company interests versus personal interests?

The fundamental issue addressed by this dimension is the degree of interdependence a society maintains among its members. It has to do with whether people's self-image is defined in terms of "I" or "We". In Individualist societies people are supposed to look after themselves and their direct family only, named as an "I" society. In Collectivist societies people belong to 'in groups' that take care of them in exchange for loyalty, named as a "We" society. In Collectivistic cultures individuals expect their relatives or members of a particular in-group to look after them in exchange for loyalty.

A low score for IDV dimension explain a "We" consciousness, in which relationships have priority over tasks and fulfill obligations to family, in-group, society represent a priority.

A high IDV score represent an "I" consciousness, an individualistic cultures, in which private opinions primate and fulfill obligations to self.

Romania, with a score of 30 is considered a collectivistic society. This is manifest in a close long-term commitment to the member 'group', be that a family, extended family, or extended relationships. Loyalty in a collectivist culture is paramount, and over-rides most other societal rules and regulations. The society fosters strong relationships where everyone takes responsibility for fellow members of their group. In collectivist societies offence leads to shame and loss of face, employer/employee relationships are perceived in moral terms (like a family link), hiring and promotion decisions take account of the employee's in-group, management is the management of groups. [The Hofstede centre, 5D culture compass, 2014]

The country scores calculated by Hofstede cultural survey: USA IDV=91 and Panama IDV=11.

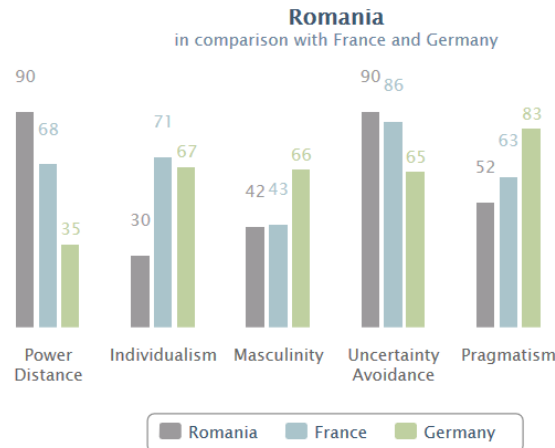
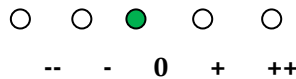


Figure 2. Romania in comparison with France and Germany

[Source: <http://geert-hofstede.com/romania.html>]

This study is based on opinions expressed by a representative sample of respondents from Galati business environment in order to assess the current situation and the desired one. The administering of questionnaires was done with the support of the project team from "Dunărea de Jos" University of Galati. The BI application explores BD, starting from the definition of a dependent variable, generating a set of logical rules that are analyzed both the quantitative information, the responses value to questionnaires II and III, as well as the qualitative data contained in the first questionnaire: gender, educational level, and the hierarchical position. The analysis will start from the defined dependent variable and will search rules, patterns of similar responses to other questions. The rules found explain "why" it were obtained the analyzed results, based on these rules it can prepare certain profiles to make predictions.

In order to be able to manage this information with the help of business analysis application presented is now needed the prior preparation of data, in terms of choosing a suitable encoding, so that the results from the questionnaire containing values from 1 to 5, will be replaced with a positive coding for the partial or total agreement and the negative for a partial or a total disagreement and the indifferent value will be considered 0. The integer values in the range [-2,2] represents an equivalent alternative to the Linkhart scores 1..5.



This will facilitate the understanding of the results, meaning that a score > 0 is the option at or ap, while a negative score represents dp + dt option. Another preliminary processing is the linearization of the data, meaning that a record will contain the completed results by a subject to all the questions from the three questionnaires, obtaining a table with 299 rows for respondents and 245 columns for answers.

Q59	In your organization the group cohesion	AP	is valued at the expense of individualism attitude
		DP	should be valued at the expense of individualism

Thus, if a group of people responded positively to the question Q59, the application will determine for these individuals to whom they gave similar responses of the other questions, in what percentage, it will calculate the probabilities for these events and will compare them between them, and will rank them. The ones with the greater predictive power will be considered possible rules, it will be checked also the reciprocity, finally validating the found patterns.

4. Analyses of Individualism – Collectivism Dimension

Table 1. Scores for the main issues of the IDV cultural dimension

		Items		score	respondents	medium score
1	Assertiveness	Q9, Q10, Q21, Q42, Q67	Pa	4466	1163	3,84
			Pd	4494	1090	4,12
2	Attachment	Q4, Q5, Q7, Q11, Q12, Q59, Q72, Q74	Pa	7793	2043	3,81
			Pd	7942	1897	4,19

		Items		score	respondents	medium score
3	Attitude	Q64, Q65, Q66, Q69, Q75, Q76, Q77	Pa	6807	2023	3,36
			Pd	7565	1895	3,99
4	Conduit	Q13, Q45, Q46, Q47, Q48	Pa	5588	1441	3,88
			Pd	6039	1331	4,54
5	Motivation	Q24, Q25, Q28, Q29, Q49, Q50, Q56, Q57, Q63	Pa	9378	2605	3,60
			Pd	10923	2457	4,45
6	Opinion	Q53, Q80	Pa	2276	578	3,94
			Pd	2515	539	4,67
7	Privileges	Q26, Q27, Q31	Pa	2606	871	2,99
			Pd	1893	820	2,31
8	Decision-making structures	Q78, Q79	Pa	2298	578	3,98
			Pd	2195	535	4,10
9	Subordination	Q30, Q34, Q54, Q55	Pa	3835	1167	3,29
			Pd	3708	1105	3,36
10	Collectivism Tendency		Pa	28806	7555	3,813
			Pd	30436	7044	4,321
11	Individualism Tendency		Pa	16241	4914	3,305
			Pd	16838	4625	3,641
12	TOTAL		Pa	45047	12469	3,613
			Pd	47274	11669	4,051

The parameterization is important because it reflects upon the obtained results, whether to configure the minimum number of cases for which it is applied a too bigger rule it can lose some rules, though they are not very obvious, it explains successfully the analyzed case. Conversely, if the set number is too low it can get too many rules, more difficult to analyze and may not validate for the large databases.

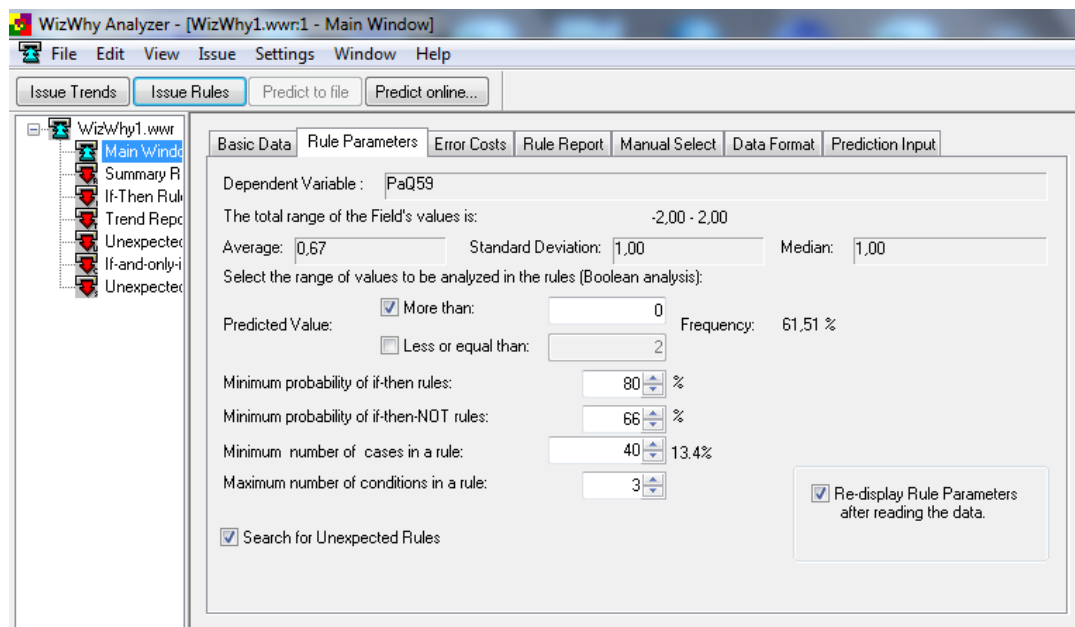


Figure 3: Rule parameters configuration in BI application

[Source: WizWhy App]

The Analysis of the explanatory power of the rules shows how the discovered rules explain the data. For each recording from the data base, the application reads the field values and applies the relevant rules determining the involved result by each rule. In this stage it determines which set of rules explains the most correct dependent variable.

Firstly, the 'if and only if' rules with two conditions, followed by the ones with three conditions, are presented. The number of favorable cases are obtained by selecting all the records that verifies all the

conditions from the rule simultaneously, not only for those with two conditions but also for those with three conditions and also for the analysed result, PaQ59 positive, while the total number of valid cases is obtained using only the condition to have a not null value for the result; the records which have not filled in the field corresponding to the analysed dependent variable will not be taken into account, because they can alter the obtained results.

The application analyzes a number of cases and the probability for each type of response, then for the combinations of those ap +, dp + dt, or + at + i, dp + dt + i, <> at <> dt, choosing finally the variants with a higher probability, on which base it determines the prediction potency for that variable.

The **Conditions** column displays the contents of the condition.

The **Positive Cases** column refers to the records where the condition holds. 3 numbers are displayed, for example: 180/200 = 0.9. These numbers denote that out of the 200 records, where the condition holds, in 180 records the predicted value holds as well. That is, if the condition holds, there is a 0.9 probability that the predicted value holds.

The **Negative Cases** column refers to the records where the condition does not hold. Once again, 3 numbers are displayed, for example: 9,800/10,000 = 0.98. These numbers denote that out of the 10,000 records, where the condition does not hold, in 9,800 records the predicted value does not hold as well. That is, if the condition does not hold, there is a 0.98 probability that the predicted value does not hold.

Table 2. Analyses by the positive cases for dependent variable PaQ59

No	Rule	Type	IF	Condition	THEN	Event	Positive Cases	Valid cases	Probability	Err Probability
1	60	If-Then	PaQ10	2	PaQ59	> 0	40	43	0,930	0,000001
		and	PaQ58	2						
2	681	If-Then	PaQ72	2	PaQ59	> 0	126	154	0,818	0
		and	PdQ59	1 ... 2						
3	691	If-Then	PdQ20	1	PaQ59	> 0	43	53	0,811	0,000697
		and	PdQ59	1 ... 2						
4	779	If-Then	PaQ10	2	PaQ59	> 0	42	47	0,894	0,000005
		and	PaQ19	2						
		and	PdQ59	1 ... 2						
5	1100	If-Then	PaQ11	2	PaQ59	> 0	46	50	0,920	0
		and	PaQ7	2						
		and	PdQ2	2						
6	1505	If-Then	PaQ12	2	PaQ59	> 0	62	76	0,816	0,000014
		and	PaQ66	1						
		and	PdQ59	1 ... 2						
7	1851	If-Then	PaQ14	2	PaQ59	> 0	43	45	0,956	0
		and	PaQ72	2						
		and	PdQ25	2						
8	2447	If-Then	PdQ2	2	PaQ59	> 0	45	48	0,938	0
		and	PaQ7	2						
		and	PaQ20	2						
9	3345	If-Then	PaQ21	2	PaQ59	> 0	42	43	0,977	0
		and	PdQ5	2						
		and	PdQ59	1 ... 2						
10	3826	If-Then	PaQ25	2	PaQ59	> 0	40	42	0,952	0
			PaQ42	2						
			PdQ78	2						

No	Rule	Type	IF	Condition	THEN	Event	Positive Cases	Valid cases	Probability	Err Probability
11	3898	If-Then	PaQ25	2	PaQ59	> 0	51	53	0,962	0
		and	PaQ80	2						
		and	PdQ42	2						
12	4445	If-Then	PaQ28	2	PaQ59	> 0	46	48	0,958	0
		and	PaQ70	2						
		and	PdQ59	1 ... 2						
13	7119	If-Then	PaQ46	2	PaQ59	> 0	42	46	0,913	0,000001
		and	PaQ72	2						
		and	Vârstă	30-44 ani						

1. Rule no. 60, found when searching the 'if' type rules, with a probability of 0.930, is found in 40 cases out of 43, explained with a probability error of 0.000001, the result to question PaQ59 being positive, at or ap respectively, if the answer to both questions PaQ10 and PaQ58 was at. The respondents which sustain that in their organisation teamwork projects are carried out (Q10) and the employees which are proud with the organisation they are working in (Q58), agree, partially or totally with the fact that, in the organisation group, cohesion is appreciated to the detriment of individualism. When analysing the "Firm" field for the registers which verify this rule, the following companies occupy the first positions: Arabesque, Arcelor, Quadrant, Armax, The Naval Shipyard, where the culture of the company seems to occupy an important position, is connected with the collective work dimension. It can be stated this is based on the small error probabilities calculated for this rule.
2. Rule no. 681 is a rule with two conditions, the first one referring to the actual practice of the company regarding human interest, if they care (PaQ72), and the second condition referring to the opinion regarding group cohesion, if it should be prime, compared to the individual attitude (PdQ59). The statement resulting from the data analysis is the following: If, in the framework of the organisation, people get involved, and care in general (total agreement) and if the opinion regarding group cohesion is a positive one ("ap" or "at"), then the group cohesion is favourably appreciated in the organisation and in the actual practice, and vice-versa. The rule can be found in 126 cases out of 154, with a probability of 0.818.
3. Rule no. 691 shows the dependency between the opinion referring to the way in which tasks should be set in a team/ group so that the activities should be stimulated (PdQ20), correlated with the opinion referring to group cohesion vs. individualism and current practice regarding the appreciation of the collective dimension. This rule can be found in 43 of 53 cases, with a probability of 0.811 and verifies the following statement: Group cohesion is favourably appreciated inside the organisation if the view regarding the desired practice is that it should be prime in the organisation ("ap" or "at") and if the tasks are well defined in the team, it should stimulate the activity (ap).
4. Rule no. 779 can be found in 42 out of 47 cases, explaining with a probability of 0.893 the following statement: In the organisations where teamwork projects is a current practice (PaQ10) and where the tasks are well defined inside the work group (PaQ19) and where the opinion regarding group cohesion is favourable (PdQ59), the collective work dimension is positively appreciated in the current practice. Analysing the 5 exceptional cases, even if they have a positive vote regarding the three conditions PaQ10, PaQ19 and PdQ59, or if they refrain or vote negatively regarding the current analysed practice PaQ59, they all have in common the fact that they are managers, on different levels.
5. Rule no. 1100 can be found in 46 out of 50 cases, explaining with a probability of 0.92 the following statement: If the organisation is loyal to its employees (PaQ7) and in their opinion, the people in management positions should try to get closer to the employees (PdQ2), and the parent's achievements are really a reason for their children to be proud, then in the current practice the collective work dimension is appreciated and encouraged. Analysing the "Firm" field, it is noticed (through the answer regarding the organisation loyalty towards employees of the same firm) that the employees are proud of the firms listed above.
6. Rule no. 1505 can be found in 62 out of 76 cases, explaining with a probability of 0.815 the following statement: If the opinion regarding group cohesion is favorable (PdQ59) and in current practice people are benevolent enough, willing to some extent to help their colleagues (PaQ66 = "ap") and the

children's success is a reason for pride, then statement PaQ59 is valid. This form has been answered in general by subjects with a university degree, who are parents.

Table 3. Analyses by the negative cases for the dependent variable PaQ59

No	Rule	Type	IF	Condition	THEN	Event	Negative Cases	Valid cases	Probability	Err Probability
14	8008	If-Then-Not	PaQ23	-2 ... 1	PaQ59	<0	42	47	0,89362	0
		And	PdQ18	-2 ... 1						
		And	PdQ59	-2 ... 0						
15	8019	If-Then-Not	PaQ41	-2 ... 1	PaQ59	<0	43	47	0,91489	0
		And	PdQ18	-2 ... 1						
		And	PdQ59	-2 ... 0						
16	8030	If-Then-Not	PaQ43	-2 ... 1	PaQ59	<0	40	53	0,75472	0
		And	PaQ75	-2,00						
		And	PdQ25	2,00						

5. Conclusions

A fundamental subject of the research is observing how the dimensions of individualism-collectivism of organizational culture from the model developed by Geert Hofstede are to be found in organizations from the Romanian economic area, and, particularly in Galati county business environment.

We found for Galati County the cultural dimension of the individualism-collectivism expressed with a high explanatory power by PdQ59, PaQ7, PaQ65, PaQ67, PaQ42, PaQ29, PaQ21, PaQ24, PaQ25, PaQ13, PaQ66, PaQ28, PaQ10, PaQ72, PaQ63, PaQ47, PaQ53, PdQ75, PaQ49, PaQ46, PaQ64, PaQ4, PaQ57, PdQ26, PaQ48 items.

The preference for team work manifested in such a high percentage among the surveyed people, thus the tendency for collectivism in Galati, the IDV score is 3,81 for the actual practice, and 4,32 for the desired practice, whereas the individual work is preferred with an IDV score of 3,3 for the actual practice and 3,6 for the desired practice, is in agreement with the predominant characteristic of collectivist cultures: the importance of the group. Yet, it can be noticed that, the difference of 0,5 between the IDV scores for the desired practice and actual practice for collectivism and only 0,3 for the individualism tendency.

Comparative to the research results regarding the preference for team work at the level of Bihor County [Abrudan, 2011], this hypothesis is also validated for Galati County study, is expressed by 72% of respondents in current practice and approximately 89% for desired practice, in accord with the opinion that group cohesion is valued at the expense of individualism attitude, with a 61,5% for current practice and up to 79% for desired practice.

The results obtained at the national level from the data processing of COMMOR project [Roşca, 2012] can provide useful information for the decision making process from the perspective of the Romanian business environment and represents an example of applied research for decision-making techniques.

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