MENTHAL MODELS AND INTELLIGENCE ANALYSIS – A SURVEY ON CORPORATE ANALIYSTS

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Abstract

While analysts are trying hard to minimize biases and errors, reality shows that many analytical products and forecasts made are not accurate. To understand some of the reasons that can explain analysis biases, we conducted a sociological survey having as our objectives identifying the extent to which different mental models are used in intelligence analysis, reviewing the associated issues that can occur in the process and assessing the impact they have on the quality of forecasts.

Keywords: intelligence analysis, mental model, research, information.

Only a few contemporary studies are based on results of scientific research which investigate, sequentially or not, issues connected to intelligence analysis. The main reason of such a situation is that the process of analysis is difficult to address due to the nature of this type of work.

However, unlike the poor data collection, nowadays many prestigious universities decided to involve intelligence experts in teaching courses on open source intelligence analysis and also a lot of private companies perform summaries and forecasts for government agencies.

In Romania there are only a few training courses for analysts, although their importance for company is bigger and bigger in the context of data Big Bang.

While analysts are trying hard to minimize biases and errors, reality shows that many analytical products and forecasts made are not accurate.

There are many opinions that today failures of intelligence analysis are generated not so much by the lack of data but by the deficient interpretation of them, by the faulty correlation of data and the errors in revealing their significance (Dumitru, 2009). So, the main problem in the current context seems to be the ability to decode and interpret available data by the analyst.

To understand analysts' barriers in making things right, psychologists have identified a number of subjective reasons that could determine errors such as the existence of prejudice, the illusion of causality, lack of a proper mental model etc. Moreover, it is important to consider external factors specific for the analytic work context such as time pressure, flow of information, insufficient data, etc. therefore it is important to understand what is the strongest category of variables generating errors and how to act to reduce or eliminate them?

To find some answers, we conducted a sociological survey with the goal to identify the extent to which different mental models are used in intelligence analysis, the associated issues that can occur and the impact they have on the quality of forecasts made.

The Methodology of Research

In this regard, we applied a questionnaire to a group of 30 analysts in an economic unit. 20 of them are female and 10 male, with different ages and work seniority, as below.

Table 1: Analysts work seniority

Work seniority	1-5 years	6-10 years	11-15 years	16-20 years
Percent	43,33	23,33	20	13,33

Table 2: Analysts age

Age	21-30 years	31-40 years	41-50 years
Percent	30	46,67	23,33

Discussion and Results

Survey data analysis revealed that 1/3 of analysts work alone, while most of them agree in statements that teamwork generates better results. Regarding allegations intensity, analysts with lower work seniority (1-10 years) claim effectiveness of teamwork in a greater extent than others (11-20 years).

Table 3: Analysts work manner

Work manner	Alone	Teamwork with other analysts	Teamwork with analysts and other experts
Percent	33,33	60	6,67

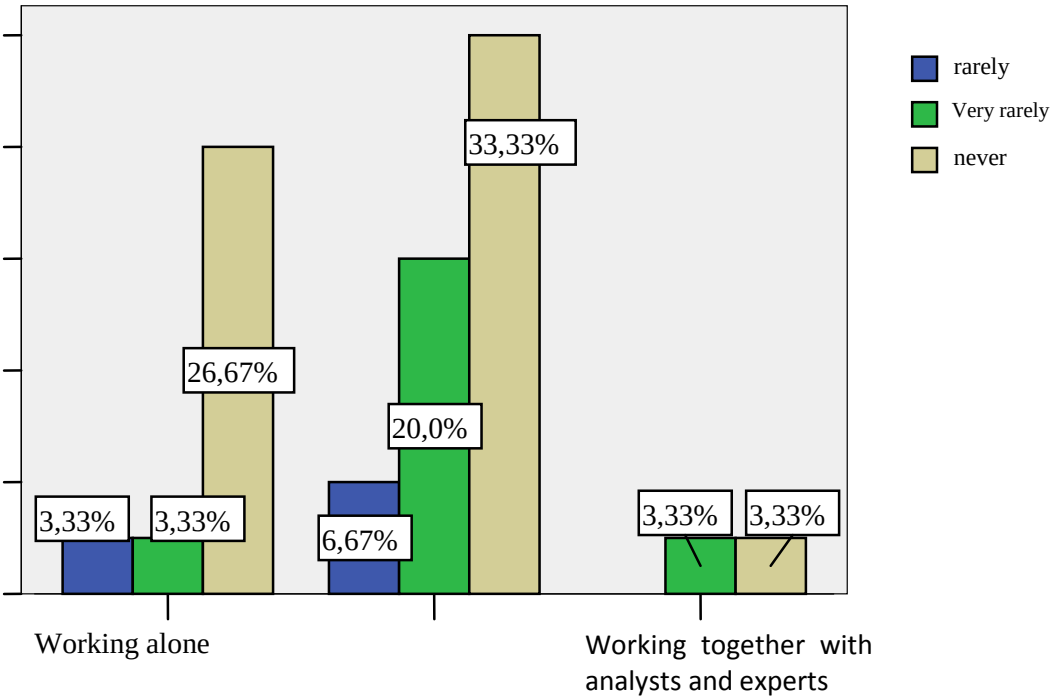
However, people opinions are that teamwork generates bigger errors than those of individually carried analysis. In the same way, analysts are more discontent with analytical product when they work in team. Also they change their opinion on an analysis already performed more rarely in conditions of individual effort (see Table 4).

Table 4.Effects of work manner on analytical products (percents)

		What is your preferred work style?	
		alone	In team with other analysts
Have you ever made errors in your analysis?	often	-	5,6
	rarely	30	55,6
	very rarely	40	38,8
	never	30	-
Analytical product was different than the desired one?	very often	10	-
	often	-	33,3
	rarely	60	33,3
	very rarely	30	27,8
	never	-	5,6
Did you changed your opinion on analysis after handing it?	often	10	-
	rarely	10	33,3
	very rarely	20	55,6
	never	60	11,1

Also, the percentage of analysts who work in teams that construct analytical products ignoring relevant data and information is significantly higher than the percent of those working alone (see chart 1).

Chart 1. Analysts that made analysis ignoring relevant data or information (percents)



So despite the prejudice that "more minds are better than one", research results show otherwise. It seems that people in group may lose important details, the manner of interpreting information is interpreted do not please everyone and the level of satisfaction on the final product is quite low.

Also, those who work alone take greater account of the views of their heads when they are contrary to their ideas and they believes that analysis errors are due to a lesser extent to conflicts with superiors (see Table 2).

Table 5. Relationship with heads vs working manner (percents)

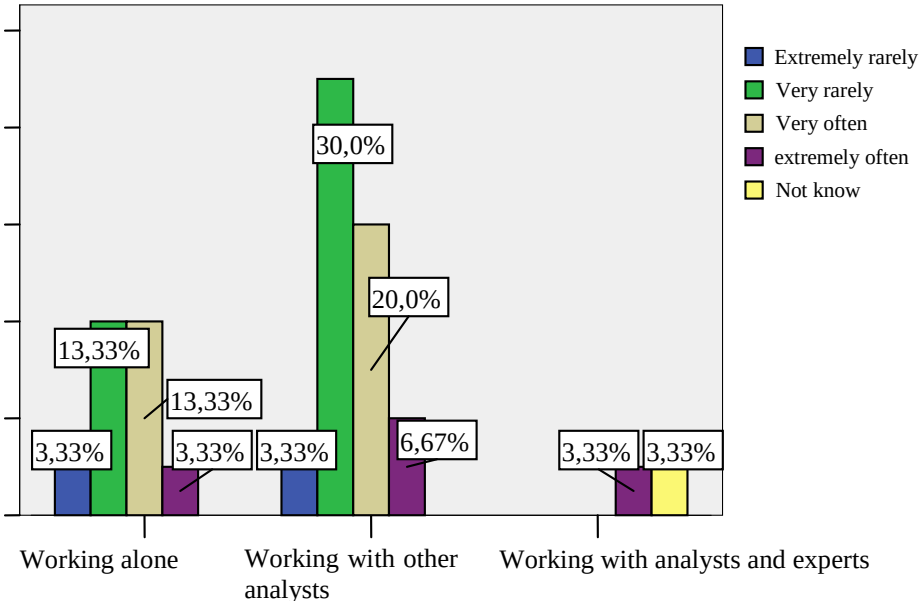
		Working manner?	
		Alone	Together with other analysts
Did you consider your head'opinions when they are against your own ideas?	Very rarely	-	5,6
	Rarely	20	38,9
	Often	40	44,4
	Very often	40	11,1

		Working manner?	
		Alone	Together with other analysts
Conflicts with bosses determine analysis errors?	Very rarely	50	22,2
	Rarely	20	27,8
	Often	20	50
	I do not know	10	-

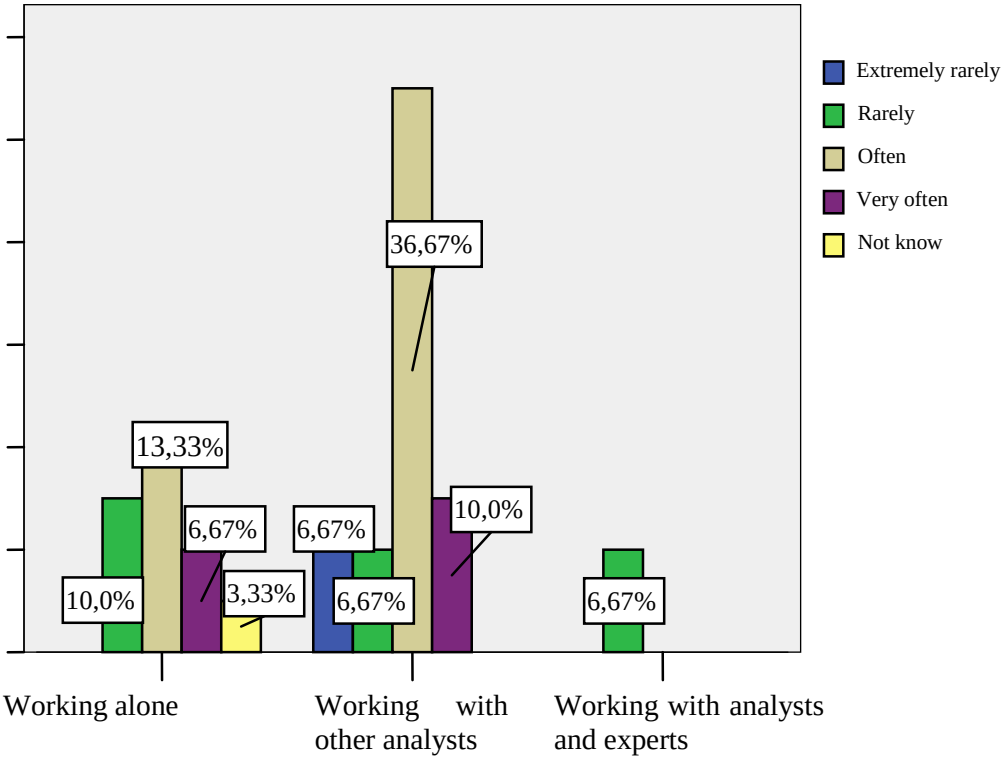
On the other hand, those who work in teams accept contrary opinions to a lesser extent but they justify more potential errors through conflicts with bosses.

There is a balanced distribution of responses regarding using the same analysis model. Thus, regardless of their work manner, the number of those who consider that a small and very small number of analysis errors are determined by the use of the same mental model is relatively equal to the number of those who believe that using the same model generate a large and very large number of errors (see chart 5).

Chart 2 5. Analysts perception that errors arise because using the same model

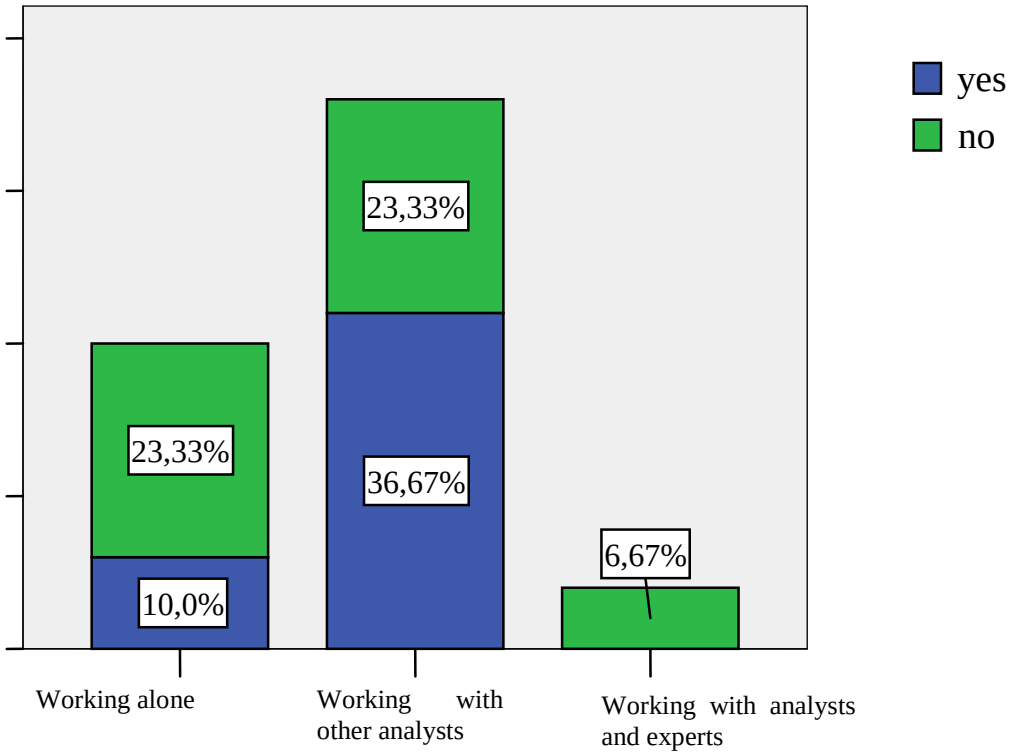


This balance is broken when analyzing *the lack of a mental model* variable. In this case, those working in teams agree more than those working alone that errors are generated by the lack of a mental model (chart 3).



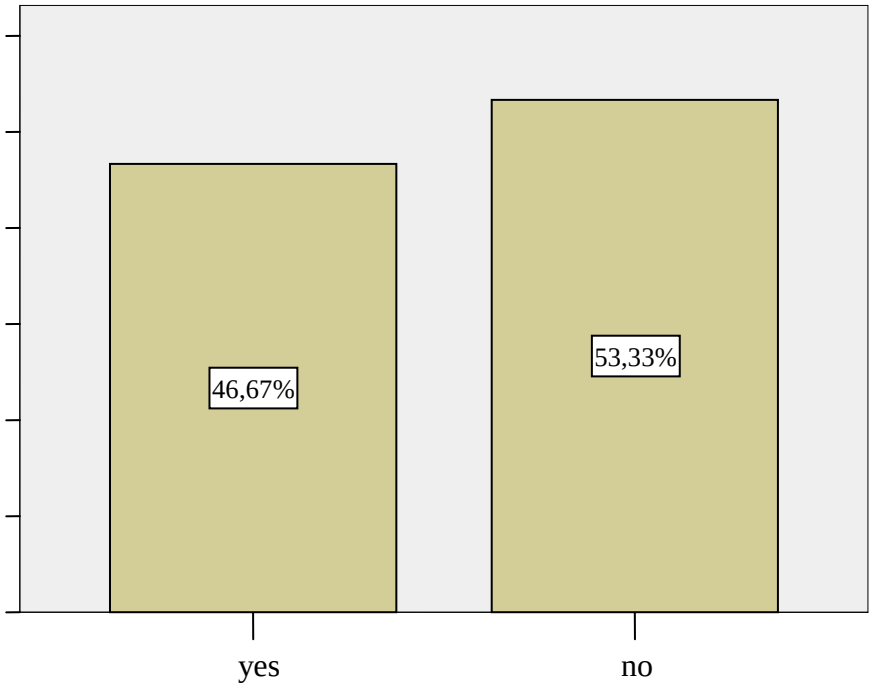
In fact, the situation is clearer examining the correlation between working manner and the existence of a mental model: those who work alone rather not use a mental model of analysis while than those who work in teams use a model to a greater extent (chart 4).

Chart 4. Do you have a model for analysis ?



While, apparently, things are very clear: half of analysts use a mental model, half did not, the implications of using a mental model are more important (chart 5).

Chart 5. Do you have a mental model for your analysis ?



Implications arising here can be summarized as follows:

• Those who use an a mental model for analysis are dissatisfied with the quality of their analyzes (demanding) than those not using that;

• Those who use a mental model often changes their views on an analysis after they handed it compared with others that are more consistent with their own views;

• Those who use mental model are more precise comparing with the others (they do not identify imaginary correlation between variables);

• Those who use a mental model are more flexible examining information from many perspectives;

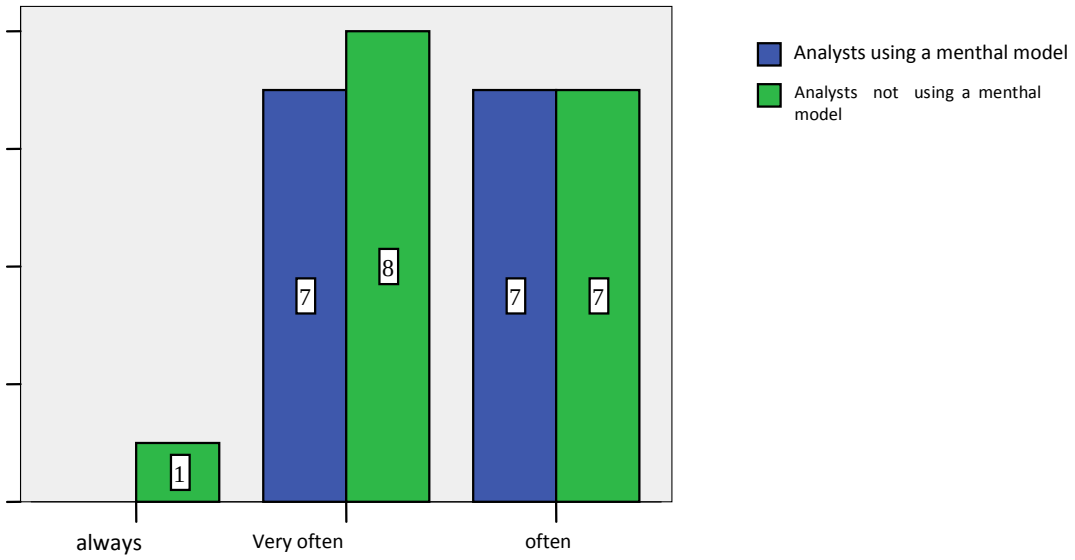
• Those who use mental model commit bigger errors in the analyzes they conduct.

Table 6. Pro and cons of using a mental model for analysis

	Pro	**Cons**	**Nonsignificant correlations**
Use of mental model for analysis	*1. Analysts are more exigent with their own work.* *2. Analysts examine data from more perspectives* *3. Analysts identify more rarely inexistent correlation.*	*1. More often they change their own point of view after handing an analysis.* *2.They commit more errors.*	*1. Confirming the forecasting* *2. Oversizing of negative data* *3. Comparing with similar analysis*

Initial forecasts tend to confirm themselves both for analysts that use or do not use a mental model (chart 6). Also, there are no differences among analysts regarding the temptation to overestimate the negative information or to relate to similar analysis conducted in the past.

Chart 6. Have your forecasts ever confirmed ?



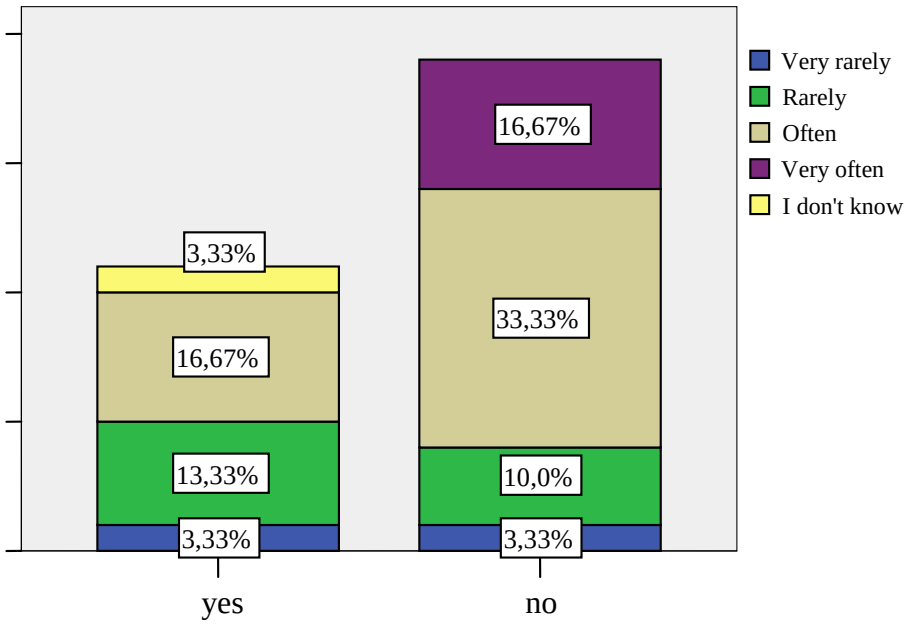
Interesting to be highlighted is the fact that the percentage of those who use a mental model increases with age, the fewer users of a mental model having less than 5 years of working experience (table 7).

Table 7. Using a mental model

		Do you have a mental model in doing analysis?	
		yes	No
Age	21-30 years	33,3	66,7
	31-40 years	42,9	57,1
	41-50 years	71,4	28,6
Work experience	1-5 years	30,8	69,2
	6-10 years	71,4	28,6
	11-15 years	50	50
	16-20 years	50	50

It is interesting to notice that analysts who not always follow the same steps in doing analysis consider that the lack of a model can determine more errors (chart 7).

Chart 7. Lack of an menthal model can determine analytical errors?



Do you follow the same steps doing an analysis?

The situation is more balanced in terms of the lack of methods: those who follow the same steps in analysing data have the same opinion as those who do not have a certain path in their analytical job.

Broken down by age and seniority, those who do not follow the same steps are mostly in the age group 21-30 years and with a work experience of less than 5 years (Table 8).

Table 8. Same analytical steps

		Doing an analysis do you follow the same steps?	
		Yes	No
Age	21-30 years	22,2	77,8
	31-40 years	42,9	57,1
	41-50 years	42,9	57,1
Work experience	1-5 years	23,1	76,9
	6-10 years	42,9	57,1
	11-15 years	50	50
	16-20 years	50	50

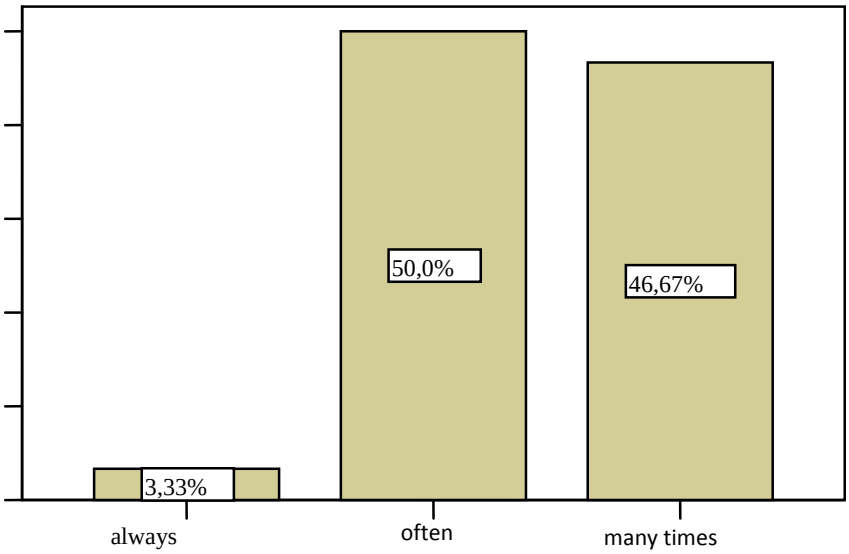
Therefore young people do not have a mental model and not follow the same steps in making a comparative analysis while those more experienced have such a model and they also have the ability to use them differentially depending on the complexity of the analysis stages. Still the young people consider in a greater extend that the lack of an analysis model and methods causes errors.

Analyzing the subjects' responses on listing the steps used in the analysis of intelligence, most of respondents have outlined a model that would include the following steps:

1. Reading the available data and information;
2. Center analyzed risk or problem;
3. Identify what elements are missing and are problematic;
4. Clarification / supplementing data by appealing to other sources;
5. Shaping assumptions;
6. Recognizing conflicting information and eliminate peripheral arguments;
7. Reconciliation of data and building arguments;
8. Developing scenarios of possible developments;
9. Drawing conclusions.

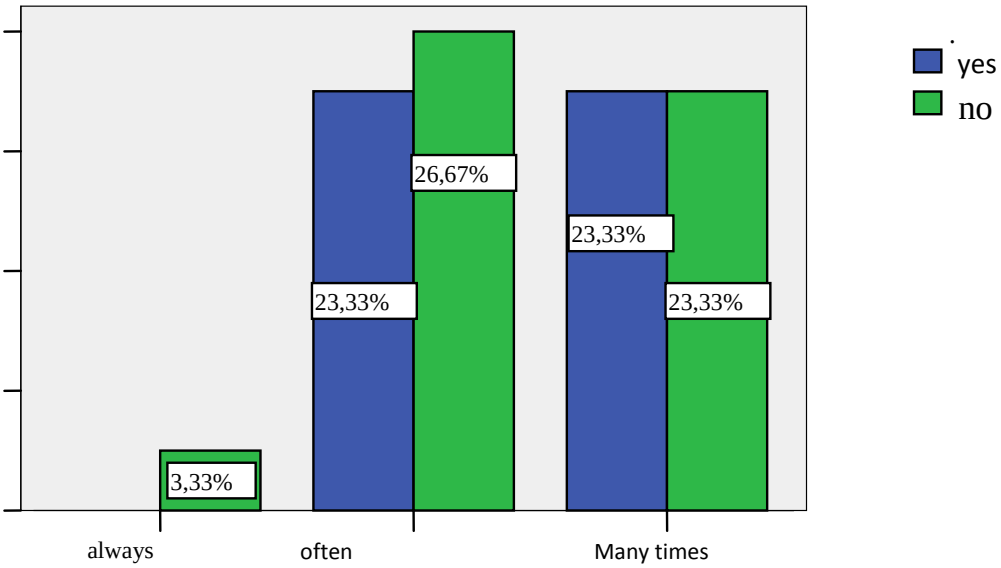
As regards the methods, only 16.7% of analysts responded they are using mostly a certain technique, but when they were asked to mention it, it resulted a limited number of methods (competing hypotheses method, scenarios method, brainstorming and content analysis).

Chart 8. Are your forecasts usually confirmed ?



According to the respondents, there is no significant difference between those who use or do not a certain mental model and the quality of their forecasts (chart 9).

Chart 9. Do you have a mental model for your analysis ?



Did your forecasts confirmed?

When the forecasts were disproved, the most common causes of such a situation concerns:

- Insufficient available data;
- The existence of contradictory data;
- Mismatch correct information;
- Lack of experience in forecasting;
- Not understanding the depth of the phenomenon;
- Invalidation of initial data;
- Poor communication routes with other departments;
- Competition for information between the sides;
- The credibility of the source;
- Changing of the situation as a result of unforeseen developments;
- The emergence of unknown variables to forecast moment;
- Insufficient attention paid to all available information;
- Lack of sufficient time allotted to the forecast.

Therefore, the variables are subjective and objective, ranging from the quality and volume of information at their disposal to lack of time. To check the consistency of subjects answers, we asked analysts to specify the ways in which they could avoid errors and increase the quality of their analyzes and forecasts:

- Establishing reasonable terms;
- Meetings with analysts from other units / institutions;
- Constant feedback;
- Exchanges of "best practices";
- Easier access to information;
- Specialization in one area;
- Increase the level of expertise and culture;
- Constant documentation on the development of the field of competence;
- Organizing working groups;
- Mentoring by people more experienced in the field.

Finally, I attempted to identify the subjective perception regarding the role of analyst. While they feel themselves insufficiently valued by their colleagues, analysts consider their role to be of an extremely high importance in the unit.

The role of the analyst is to give added value to information and to transform data into meaningful messages relevant to corporation plan. The analyst developed analytical products to support managers decisions.

Conclusions

Significant items arising from the interpretation of data are:

- Teamwork generates greater errors in analysis and analytical discontent with the product are higher compared to the situation in which people work individually. It seems that working in teams can cause losing of

important details regarding the way information is interpreted and the level of satisfaction on the final product is quite low.

• Those who work alone rather not use a mental model of analysis than those who work in teams.

• Those who use a mental model are more dissatisfied with the quality of their analyzes, they use to analyze information from several perspectives and identifies more rarely inexistent correlations comparing with the others. Instead, they commit greater errors in the analyzes they perform and change their views on analysis more often after they handed it compared with others that are more consistent with their own views.

• Forecasts made tend to confirm themselves both for those who use or not use a mental model in analysis.

• Young people rather do not have a mental model in an analysis compared with the older and more experienced. Still they consider that such a lack would generate errors. In other words, those who use models and methods of analysis considers that errors are only partially generated by the lack of such a habit, while those who do not use them considers that the lack of errors and methods are strongly correlated.

Still it is important to understand that nowadays the work of analysts is vital, as he is the one who gives added value to information by transforming data into meaningful products relevant to corporation objectives.

References

1. Dumitru Irena. (2009). *Psihologia analizei informației*, Unpublished course.
2. Heuer Richards Jr. (1999). *Psychology of Intelligence Analysis*, Central Intelligence Agency, Washington D.C.
3. Maior George Cristian. (2008). *Cuvânt de deschidere* in „Intelligence", no. 13.