

MICROCOGNITIVE FUNCTIONING AND MANAGERIAL BEHAVIOUR

This paper introduces a conceptual model of cognitive functioning – an overarching cognitive structure model, and determines the impact of each cognitive level upon the establishment of a more coherent and sustainable managerial behavior. It analyses the micro-cognitive level, which examines the compatibility between cognitive abilities and managerial activities. On this ground, the paper determines the valence of twenty three cognitive indicators and analyzes their significance for the enhancement of managerial effectiveness and performance.

JEL: D03; D22

Cognitive functioning is determined by the ingrained cognitive abilities of the managerial staff. These abilities set the preferred way of information processing and define the level of managerial effectiveness. In case there is a high level of compatibility between managerial activities and cognitive abilities it is expected a high degree of managerial effectiveness. In turn, a low level of compatibility leads to impoverished managerial performance and organizational results. Therefore one of the main challenges of the contemporary management science is to differentiate the levels of cognitive functioning and the interaction between cognitive and managerial abilities, competences and approaches and determine how these interactions results in a more effective and sustainable managerial behavior. Our good understanding of the process of transformation of cognitive into managerial functioning lets us develop a well-grounded knowledge base related to the level of compatibility between managerial activities and cognitive abilities. For this purpose the paper examines behavioral dimensions of cognitive indicators (key behavioral traits and characteristics) and their catalyzing impact on managerial behavior. The assignment of a catalyst value to the proposed cognitive indicators enables management to optimize managerial activities in various managerial situations, to set managerial goals and objectives and to enhance the overall level of organizational effectiveness.

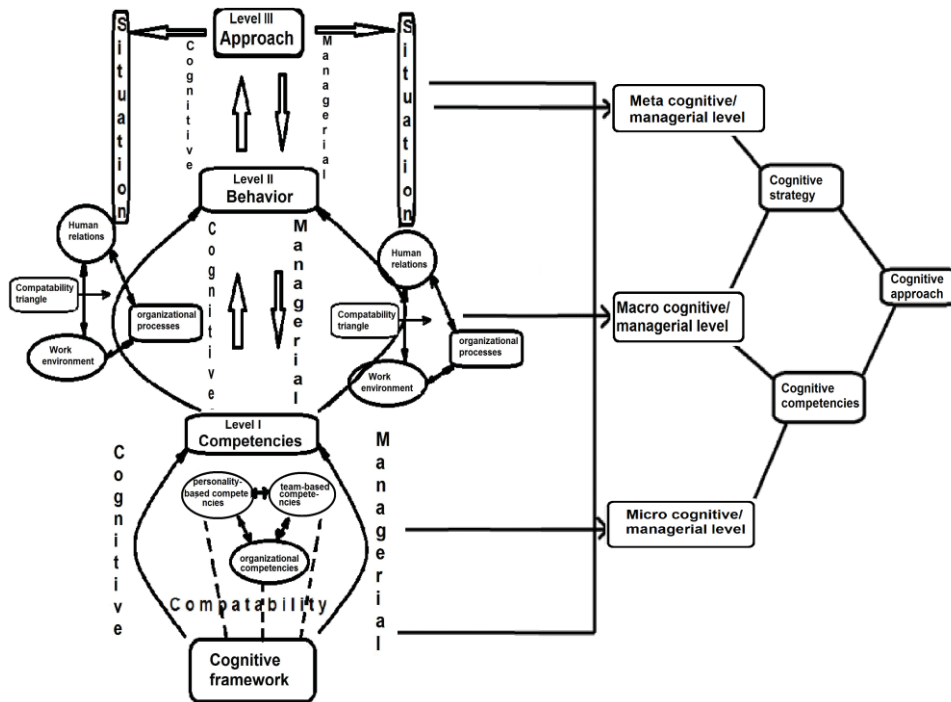
The purpose of this paper is to present an overarching cognitive functioning model – a *cognitive structure model*. The objective is to analyze the micro cognitive level of this structure and to measure its significance for managerial effectiveness and more sustainable organizational development. The paper argues that the level of managerial effectiveness is immediately related to the level of compatibility between cognitive and managerial abilities, which in turn shapes a diverse set of organizational processes and managerial activities. Thus, managerial effectiveness is defined as an *optimal balance between managerial activities corresponding to the behavioral output* that cognitive abilities have on managerial/organizational performance in various decision-making situations.

Cognitive structure and managerial activities

The cognitive structure model sets the level and means of interaction between cognitive and managerial abilities, competencies and approaches. This model exemplifies a dynamically changing *meta system* of cognitive elements aimed at optimizing managerial behavior in various managerial situations. The basic level of this structure is the cognitive frame – a deeply ingrained and stable composition of behavioral traits and characteristics that determine the preferred way of information processing, behavioral output of cognitive functioning and level of compatibility between cognitive abilities and managerial activities. The nature and levels of the cognitive structure analysis is illustrated in *Figure 1*.

Figure 1

An overarching cognitive structure model and levels of cognitive functioning



There are three cognitive structure levels presented in Figure 1 – *micro-, macro- and meta-cognitive levels*. The micro-cognitive level studies the interrelationship between cognitive frames and managerial activities. Thus, it helps us establish the level of compatibility between cognitive abilities and managerial activities. Furthermore, it helps us identify the core cognitive indicators, their valence, and impact on managerial activities/behavior.

At the *macro level*, cognitive functioning is studied as a number of dependencies between *cognitive competencies* (abilities and preferences), *behavioral traits and characteristics* (cognitive indicators) and their reflection on managerial activities and processes. This level of analysis studies the compatibility between cognitive functioning (the preferred way of information processing), on the one hand, and managerial behavior towards the established organizational goals and objectives, on the other. To a great extent the level of compatibility at this stage of analysis determines the optimal managerial behavior and favorable/unfavorable outcome of the organizational output and accomplished managerial results. The *meta-cognitive system's analysis* of the cognitive structure seeks to determine the optimal balance between managerial activities comprising each individual organizational process in a diffusion of managerial situations¹. This balance helps create a DNA of organizational performance and enhances the level of organizational ecology².

Depending on the nature of managerial activities, the cognitive frame at the micro-cognitive level is subdivided in four basic cognitive categories – *Analytical, Conceptual, Administrative and Communicational*³ (refer to Table 1).

Table 1

Cognitive frame sub-categorization

| | Analytical | Conceptual | |
|-------------|--|--|--------------|
| Category I | <ul style="list-style-type: none"> - Convergent cognitive frame; - Disquisitional cognitive frame; - Coherent cognitive frame; - Methodical cognitive frame. | <ul style="list-style-type: none"> - Liberal cognitive frame; - Visual cognitive frame; - Innovative cognitive frame; - Analogical cognitive frame. | Category III |
| Category II | <ul style="list-style-type: none"> - Traditional cognitive frame; - Intuitive cognitive frame; - Profound cognitive frame; - Divergent cognitive frame. | <ul style="list-style-type: none"> - Verbal cognitive frame - Reflective cognitive frame; - Perfunctory cognitive frame; - Impulsive cognitive frame | Category IV |
| | Administrative | Communicational | |

¹ The research scope of this article limits the analysis to the micro-cognitive functioning. The impact of the macro- and meta-cognitive functioning on managerial behavior, organizational performance and sustainable business development will be researched in a future cognitive study on this subject.

² Organizational ecology aims at determining the coefficient of managerial utility and optimizing organizational behavior and performance in various managerial situations. Refer to the PhD thesis defense of Viktor Hadjiev, 30.10.2012 at the "Academy of Economics", Svishtov, Bulgaria.

³ Hadjiev, 2012, 214 p.; Hadjiev, 2011, p. 110-127.

The cognitive frame sub-categorization helps determine the level of compatibility between cognitive abilities and behavioral traits and characteristics, on the one hand, and advances an organic cognitive perspective, on the other. This perspective defines managerial preferences with respect to the assigned managerial responsibilities and activities. The cognitive frame sub-categorization also helps determine the catalyst level of the studied cognitive indicators for a wide range of managerial activities. In addition, it determines the interaction possibilities (the valence of cognitive indicators) in the process of enhancing managerial effectiveness and transforming cognitive functioning into a sustainable managerial behavior.

The cognitive frame of the *Analytical and Administrative* categories leads to routine managerial activities and preferences that aim at refining and perfecting rather than revamping and revisiting managerial processes.⁴ This in turn leads to a managerial behavior that does not intend to provide alternative courses of action to the way processes are navigated within an organization but to pave a more detailed and analytical path as to how these processes are implemented in an organization. The Analytical cognitive frame subdivision includes the *Convergent, Disquisitional, Coherent and Methodical* cognitive frames. The level of compatibility between cognitive frames and managerial activities is the subject of research in this part of the paper.

The *Convergent* cognitive frame is of highest compatibility with auditing managerial activities. The focus of the managerial staff with convergent cognitive abilities is not on swiftness and efficiency, but rather on greater level of accuracy and detail during the implementation of their managerial activities and organizational problem-solving. The managerial preferences entail a team environment, where all team members have a clearly defined and well structured managerial tasks and responsibilities.

The *Disquisitional* cognitive frame is highly compatible with academic/research type of managerial activities. More often than not, these cognitive abilities lead to managerial behavior steeping in a greater degree of personal and professional development. In this sense their managerial behavior exhibits a greater proclivity towards a more systematic approach to problem-solving in the implementation of their organizational activities. There is a clearly define preference for a work environment where all team members are well-established professionals in their field of specialization. The interaction between the personnel with disquisitional cognitive abilities often aims at achieving higher professional results and self-developing knowledge base organizational activities.

The *Coherent* cognitive abilities are highly compatible with managerial activities in the field of information technology and finance. The management behavior of

⁴ The cognitive frames of the *Analytical and Administrative* categories gravitate towards the *Analytical* cognitive pole, whereas the cognitive frames belonging to the *Conceptual and Communicational* categories gravitate towards the *Holistic* cognitive pole. The impact of cognitive poles on managerial behavior is analyzed by: Hadjiev, 2012; Hermann, 1994; Mintzberg, 1976, p. 49-58; Kozhevnikov, 2007, 464-481; Leonard, and Straus, 1997, p. 111-121.

individuals with this type of cognitive preference endeavors to achieve a greater level of systematization of organizational processes and degree of specialization. As a result, the managerial process is perceived as a system of clearly defined and interrelated activities. The successful implementation of organizational objectives depends on the completion of the initiated managerial activities adherent to each and every one of the established developmental stages. In this sense the managerial process is incremental in nature and its development is contingent upon a clear differentiation of all dependencies between the ongoing managerial activities. The team efforts aim at improving the level of synchronization between the activities of all team-members.

The *Methodical* cognitive frame is highly compatible with managerial activities typical for the insurance field. The managerial staff with methodical cognitive abilities form their managerial behavior based on the level of compatibility between the concrete managerial situation, proposed managerial goals and initiated managerial activities. The managerial process follows a more coherent and logical framework developed on the basis of intuitive cause-and-effect relationships. As a result, in the decision-making process it is expected a greater level of interdependencies between key managerial factors and activities. In this case the managerial behavior is not seeking to establish a well-defined structural hierarchy within the organization but to provoke a greater degree of balanced organizational activities aimed at achieving an optimal managerial result. The dependencies between cognitive abilities and managerial activities pertaining to the *Analytical* cognitive frame are presented in Table 2.

Table 2

Interaction between cognitive abilities and managerial activities in the Analytical category

| | |
|---|---|
| <p>- Convergent cognitive abilities are of highest compatibility with auditing managerial activities; the managerial focus is not on swiftness and efficiency but rather on greater level of accuracy and detail during the implementation of their managerial responsibilities and organizational problem-solving.</p> | <p>- Disquisitional cognitive frame is highly compatible with academic/ research type of managerial activities. More often than not, these cognitive abilities lead to managerial behavior steeping in a greater degree of personal and professional development.</p> |
| <p>- Coherent cognitive abilities are highly compatible with managerial activities in the field of information technology and finance; The management behavior of individuals with this type of cognitive preference endeavors to achieve a greater level of systematization of organizational processes and degree of specialization.</p> | <p>- Methodical cognitive frame is highly compatible with managerial activities typical for the insurance field. The behavior of the managerial staff is based on the level of compatibility between the concrete managerial situation, the proposed managerial goals and the initiated managerial activities.</p> |

Analytical category

- **Convergent** cognitive frame;
 - **Disquisitional** cognitive frame;
 - **Coherent** cognitive frame;
 - **Methodical** cognitive frame.

The *Administrative* cognitive category encompasses the *Traditional, Intuitive, Profound and Divergent* cognitive frames. The managerial preferences that are highly compatible with the *Traditional cognitive frame* result in a logistics-base managerial activities. This in turn leads to a managerial behavior that exhibits clear proclivity towards a regulated organizational environment with well-established rules and procedures. The traditional cognitive abilities drive a managerial behavior attuned to a more routine organizational activities characterized with a greater degree of intensity. The successful completion of this type of managerial activities depends on team members' level of coordination and their ability to set a realistic time-frame required for the implementation phase of their managerial tasks and responsibilities.

The *Intuitive* cognitive abilities are highly compatible with managerial activities in the field of journalism and tactical intelligence. The behavior of the managerial staff often results in rethinking managerial processes and extending concrete recommendations for their improvement. The managerial process is undergoing changes on a trial and error bases and aims at achieving optimal not maximal managerial results. In this sense the managerial focus is on the way organizational decisions were adopted and implemented in the past. On this ground, the managerial staff jumps to performance conclusions related to the diverse nature of managerial activities and their role for the effective and efficient development of the managerial process.

The *Profound cognitive* abilities are highly compatible with the implementation of operational and regulatory managerial activities. This in turn generates behavioral aspects that result in an enhance level of managerial effectiveness and clearly formulated managerial goals and objectives. The cognitive abilities' interaction produces a behavioral dimension that does not focus on team performance and interaction but on the achieved managerial result. Organizational activities and success thereby depend on the level of specialization and proper allotment of labor tasks among all team members.

The *Divergent cognitive frame* leads to a behavioral output that is highly compatible with the implementation of administrative managerial activities. The managerial behavior of the staff with this set of cognitive abilities is initiated on a relatively flexible but well coordinated managerial approach to problem solving. It follows a more inclusive approach to organizational process development and does not tend to segregate the components that generate it. The managerial zeal towards exploring new development opportunities through innovation and perfection of organizational activities is often of leading importance in the implementation and developmental phase of the managerial process. Such behavior upscales the risk of managerial improvisation, on the one hand, but stimulates capacity building efforts of the managerial staff. The behavioral aspects of the divergent cognitive functioning are synthesized in Table 3.

Table 3

Interaction between cognitive abilities and managerial activities in the Administrative category.

| | | | |
|--|---|--|---|
| C a t e g o r y II | Administrative | <p>- Traditional cognitive abilities are highly co-compatible with logistics-based managerial activities. They drive a managerial behavior attuned to a more routine organizational activities characterized with a greater degree of intensity. The successful completion of this type of managerial activities depend on team members' level of coordination.</p> | <p>- Intuitive cognitive abilities are highly compatible with managerial activities in the field of journalism and tactical intelligence. The behavior of the managerial staff often leads to re-thinking managerial processes and extending concrete recommendations for their improvement.</p> |
| | <p>Traditional cognitive frame; - Intuitive cognitive frame; - Profound cognitive frame; - Divergent cognitive frame.</p> | <p>- Profound cognitive abilities are highly compatible with the implementation of operational and regulatory managerial activities. This in turn generates behavioral aspects that result in an enhance level of managerial effectiveness and clearly formulated managerial goals and objectives.</p> | <p>- Divergent cognitive abilities lead to a behavioral output that is highly compatible with the implementation of administrative managerial activities. The managerial behavior of the staff with this set of cognitive abilities is initiated on a relatively flexible but well coordinated managerial approach to problem solving.</p> |

The *Conceptual and Communicative cognitive* categories often lead to managerial behavior conducive to identifying impediments in the overall managerial process, restructuring managerial activities and revamping managerial goals and objectives. Managerial behavior and team interactions do not aim at maintaining the organizational status quo, but rather at stimulating managerial activities that lead to different quantitative alterations in the managerial process. The *Conceptual cognitive frame* is compounded by the *Liberal, Visual Innovative and the Analogical* sub-frames. In turn, the *Communicative* include the *Verbal, Reflective, Perfunctory and the Impulsive* frames.

The *Liberal* cognitive abilities produce behavioral output that is highly compatible with human resources (HR) managerial activities. The managerial approach to coping with decision-making situations and problem solving does not aim at enhancing the level of technical specialization but rather enriching the knowledge base and the skill level of all employees in the organization. In this endeavor, a priority is attributed to managerial activities that foster good business and educational practices, as well as to activities that strike a balance between social and economic aspects of organizational development. This often leads to a more socially responsible and versatile goal-setting environment and fosters team

interaction conducive to a higher level of conveyance of managerial objectives and enhanced performance.

The cognitive analysis indicates that project-based managerial activities are highly compatible with the *Visual* cognitive frame. The cognitive abilities within this frame produce managerial behavior that results in a performance peak when it seeks a more precise and effective implementation of the defined organizational goals and objectives. The behavioral output creates a hub of key managerial processes. This output is characterized by both the zeal to prioritize project's activities based on a pre-defined managerial concept, on the one hand, and by identification of the challenges and perspectives for managerial processes development, on the other. On this base, the managerial staff jumps to performance decisions related to the continuity and intensity of the project activities carried out as part of the pre-defined organizational goals and objectives. Managerial success to a large extent depends on the level of synergy and synchronization among all team members and managerial teams.

The *Innovative* cognitive frame is highly compatible with managerial activities carried out in the fields of marketing, advertising and organizational design. The cognitive abilities output results in a non rational judgment and more spontaneous managerial behavior that is often guided by ideas generated by the particulars of the concrete business situation. In view of this, the organic managerial preferences seek dissolution of problems emerging in a versatile set of organizational undertakings. Such behavior often leads to innovative solutions to organizational development problems and to adoption of new strategies, development of new products/services and application of new technologies in the business development process. To a great extent the successful implementation of all managerial activities comes down to the level of interdependence and interaction among all stakeholders in the business development process. The purpose of such interaction is guided by the necessity to determine the utility and reliability of the proposed innovative solutions in the process of achieving the core set of organizational goals and objectives.

The behavioral output that results in an optimal performance during the implementation of judicial managerial activities is based on its high level of compatibility with the *Analogical* cognitive abilities. The fusion between all cognitive indicators within this frame generates organic managerial preferences that lead not to a greater level of field specialization but to the establishment of an organizational structure and normative procedures intended to legally protect all organizational activities pointing to the established goals and objectives. This type of managerial behavior leads to the removal of legal restrictions and barriers which in turn enhances the functionality and the effectiveness of all organizational processes and activities. To this end, a good understanding of the nature of these processes is of utmost importance. All decision-making and team interactions often come down to a single-handed approach to problem solving. All behavioral aspects of the conceptual micro-cognitive functioning are presented in *Table 4*.

Table 4

Interaction between cognitive abilities and managerial activities in the Conceptual category

| | | |
|--|--|---|
| <p>- Liberal cognitive abilities produce behavioral output that is highly compatible with human resources (HR) managerial activities. The managerial approach to coping with decision-making situations and problem solving does not aim at enhancing the level of technical specialization but rather enriching the knowledge base and the skill level of all employees in the organization.</p> | <p style="text-align: center;">Conceptual category</p> <p style="text-align: center;">C a t e g o r y</p> <p style="text-align: center;">- Liberal cognitive frame; - Visual cognitive frame; - Innovative cognitive frame; - Analogical cognitive frame.</p> | <p>- Visual cognitive abilities within this frame produce managerial behavior that results in a performance peak when it seeks a more precise and effective implementation of the defined organizational goals and objectives. The behavioral output creates a hub of key managerial processes.</p> |
| <p>- Innovative cognitive frame is highly compatible with managerial activities carried out in the fields of marketing, advertising and organizational design. The cognitive abilities output results in a non rational judgment and more spontaneous managerial behavior that is often guided by ideas generated by the particulars of the concrete business situation.</p> | | <p>- Analogical cognitive abilities are highly compatible with the implementation of judicial managerial activities. Managerial preferences lead not to a greater level of specialization but to the establishment of an organizational structure and normative procedures intended to legally protect all organizational activities pointing to the established goals and objectives.</p> |

The *Verbal* cognitive abilities are highly compatible with public relations and sales-type of managerial activities. This in turn leads to a behavioral output that expedites the conveyance of organizational goals/objectives. The decision-making process evolves around a high level of trust, interdependence and interaction between the designated working teams. This process is often guided on the bases of feedback analysis in various problem-solving situations. The managerial accent is not on the level of teams' discipline and efficiency but rather on setting-up informal communication channels that catalyze the adjustment of the initiated managerial activities to the problem at hand.

The *Reflective* cognitive abilities are highly compatible with forward-looking, research and development (R&D) managerial activities. These activities have a direct impact on organizational strategic development processes and their successful implementation is determined by the innate cognitive preference of the managerial staff to synthesize a huge volume of information and to clearly differentiate between the specifics of various managerial processes. As a result, this cognitive frame points to a behavioral output based on an all-round understanding of ongoing decision-making activities and on the environment within which they take place. The contextual perception in turn helps managers set well grounded strategic objectives, determine the quintessence of organizational problems solving and make realistic assumptions about the future development of all managerial processes and activities.

The cognitive essence of the *Perfunctory* frame renders managerial preferences that are highly compatible with activities taking place in a dynamic organizational environment. In particular, these managerial activities aim at broadening the client-

based organizational network and introducing socially responsible business practices. The behavioral output is often based on sympathy, compassion and sensitivity towards clients' needs and their level of comfort with the provided organizational product or service. The behavioral dimension of managers with perfunctory cognitive abilities leads to a moral appraisal of decision-making situations. This in turn often entails impulsive action grounded on the base of subjective reasoning. The decision-making output results in a more humane and benevolent approach to problem-solving situations, which often leads to concessions in the production process and manufacturing results.

The *Impulsive* cognitive frame nurtures behavioral dimension compatible with technical managerial activities. The cognitive interaction exhibits clear preference for directive/instruction-based managerial behavior. Constructive decision-making is often constrained by spontaneity and emotion-lead aspects characterizing the problem-solving nature of business communications. As a result, the successful implementation of this managerial set of activities is contingent upon a clear-cut and well-defined managerial goals and objectives. These goals and objectives often serve as an outlet that ingrains a sense of purposeful behavior and infuses a meaning in the decision-making process. In addition, they help team-members to understand the nature in the interplay of managerial tasks and convey realistic understanding of their roles and responsibilities within the stipulated organizational setting. The dependencies between cognitive abilities and managerial activities pertaining to the *Communicative* cognitive frame are portrayed in Table 5.

Table 5

Interaction between cognitive abilities and managerial activities in the Communicative category

| | |
|---|--|
| <p>→ Verbal cognitive abilities are highly compatible with public relations and sales-type of managerial activities. This in turn leads to a behavioral output that expedites the conveyance of organizational goals/objectives. The decision-making process evolves around a high level of trust, interdependence and interaction between designated working teams.</p> | <p>- Reflective cognitive abilities are highly compatible with research and development (R&D) managerial activities. These activities have a direct impact on organizational strategic development processes and their successful implementation is determined by the innate cognitive preference of the managerial staff to differentiate between process specifics.</p> |
| <p>- Perfunctory cognitive abilities render managerial preferences that are highly compatible with activities taking place in a dynamic organizational environment. In particular, these managerial activities aim at broadening the client-based organizational network and introducing socially responsible business practices.</p> | <p>Impulsive cognitive frame nurtures behavioral dimension compatible with technical managerial activities. The cognitive interaction exhibits clear preference for directive/instruction-based managerial behavior. Constructive decision-making is often constrained by spontaneity and emotion-lead behavioral aspects.</p> |

The cognitive analysis in this part of the study seeks to reveal the nature of managerial activities and their overall compatibility with a particular set of cognitive

abilities that typify the process of cognitive transformation into a more coherent, effective and sustainable managerial behavior. A starting point and a guiding light in the cognitive transformation process is attributed to a number of cognitive indicators (behavioral traits and characteristics) that reveal the organic preferences for information processing at the micro-cognitive level. These indicators help reveal the intensity of micro-cognitive functioning and serve as catalysts of managerial behavior and managerial activities. The cognitive indicators and their behavioral dimension do not aim at determining which cognitive frame enjoys superiority or inferiority in the decision-making process but rather to reveal their significance and aptitude in various managerial activities and decision-making situations. As a result, cognitive frames do not follow a certain hierarchical order. The only hierarchical niche in cognitive functioning is that of logic. It helps revealing the intensity and impact of cognitive indicators on managerial behavior. The impact of cognitive indicators on managerial reasoning and performance is a subject for analysis in the next part of the study.

Cognitive catalysts and managerial behavior

Cognitive functioning analysis at the micro-level deals with measuring the impact of cognitive indicators upon cognitive abilities and the transformation of cognitive functioning into a unique managerial behavior fostering a unique set of managerial activities⁵. As a result, this part of the study aims at facilitating this impediment by forging a table of cognitive compatibility, which determines the impact level of each and every cognitive indicator upon various managerial activities and their cognitive valence⁶. The objective of this part of the study, therefore, is to determine the level of diffusion of cognitive indicators and their relevance for managerial action or inaction in various decision-making situations. The micro-cognitive analysis also helps identify the managerial competences adherent to each one of the examined cognitive frames and to determine their organic cognitive structure⁷. As a whole, the interactions among cognitive catalysts/indicators form managerial competencies, which in turn reveal the embryonic core of adherent managerial activities and organizational processes. In general, managerial competences are defined as key behavioral factors that are of utmost importance in determining managerial behavioral dimensions and the level of managerial effectiveness and efficiency.

⁵ The cognitive analysis in this part of the study is based on the study of: Hadjiev, 2012, 214 p.; Other studies measuring the impact of behavioral characteristics on managerial performance pertain to: Cassidy, 2004, p. 419-444; Myers, McCaulley, Quenk, and Hammer, 2003; Cattell, Eber and Tatsouka, 1970; Myers et. al., 2003; Myers, and Mayers, 1998.

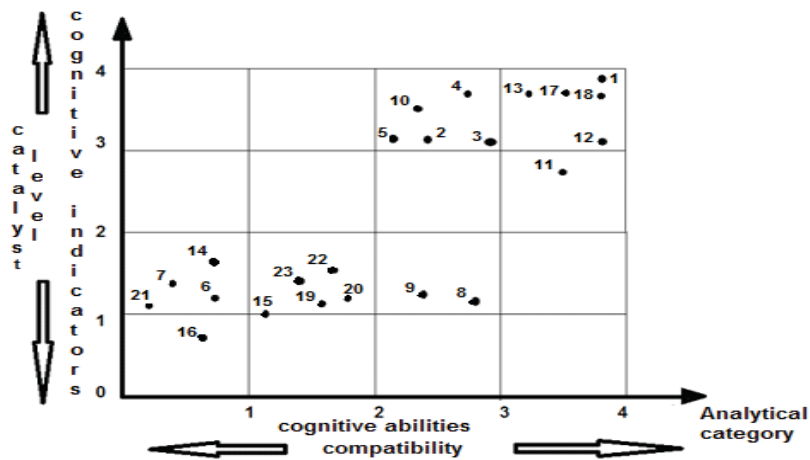
⁶ Cognitive valence determines the number of possible interaction among cognitive indicators in the implementation of various managerial activities.

⁷ A micro-level cognitive structure is a DNA structure type which is determined by the valence of cognitive indicators. It in turn helps us specify which managerial competences are crucial for what type of managerial activities.

Cognitive catalysts in the *Analytical* frame are illustrated on Figure 2. From this figure it becomes evident that the indicators with the strongest catalyzing impact on managerial behavior/activities and the highest cognitive level of compatibility with the analytical cognitive abilities are *Precision* (1), *Logical thought* (18), *Objectivity* (17), *Consecutiveness* (13) and *Critical thought* (12). The behavioral dimension of *precision* has to do with the level of accuracy of the designated managerial activities. That of *logical thought* reflects on the managerial ability to define well articulated and grounded managerial goals and objectives. The behavioral dimension of *openness* results in the propensity of management to provide detailed information regarding the challenges and approaches to problem-solving in various decision-making situations. *Consecutiveness* in turn cultivates managerial abilities that lead to the establishment of a well-defined structural framework within which are launched all managerial activities and are assigned all managerial responsibilities and obligations. The behavioral output of *critical thought* develops managerial competences which enhance the overall level of organizational performance.

Figure 2

Compatibility of cognitive indicators and their level of catalysis in the Analytical category.



Another set of cognitive indicators (behavioral traits and characteristics) that has a strong catalyzing effect on managerial activities but is less compatible with the analytical cognitive abilities in the studied cognitive category includes: *Prudence* (4), *Rational behavior* (10), *Efficiency* (3), *Reliability* (2) and *Discipline* (5). The behavioral dimension of *prudence* results in the managerial ability and preference to discuss and seek solution to problems emerging in the managerial process. The catalyzing effect of *rational behavior* develops managerial abilities that are established on the preference of optimizing managerial resources. The

behavioral aspect of *efficiency* is portrayed in the swiftness and quality in the implementation of the designated managerial activities. *Reliability* in turn builds managerial competences that enhance the level of responsibility in the decision-making process and heightens the expectation level for successful dissolution of newly emerged managerial problems, objectives and activities. The cognitive transformation of *discipline* in turn leads to a behavioral output that adheres to commonly accepted organizational procedures and regulations.

Cognitive indicators that have significantly lower catalyzing effect on managerial behavior and level of compatibility with the cognitive abilities in the analytical cognitive frame include: *Intuition, Openness, Spontaneity, Innovativeness, Flexibility, Subjectivity, Analogical thinking, Frivolous thinking, Impulsiveness, Emotiveness, Open Mindedness and Morality*. The catalyst level of the studied cognitive indicators, their level of compatibility and behavioral significance in the implementation of the specified managerial activities in the Analytical cognitive category are presented in Table 6.

Table 6

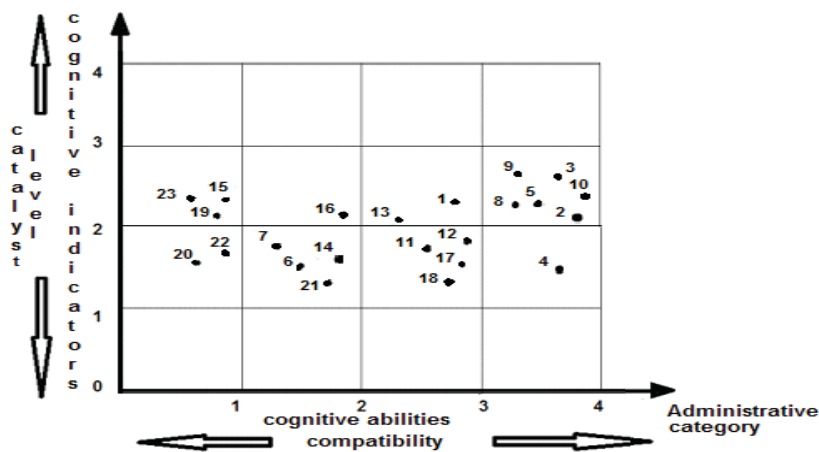
Catalyst and compatibility levels of cognitive indicators in the Analytical cognitive category

| Cognitive indicators (behavioral traits and characteristics) | Catalyst levels of cognitive indicators (from 0-4) | Level of compatibility between cognitive indicators and managerial activities in the Analytical category (from 0-1) |
|--|--|---|
| Precision (P) | 4 | 1 |
| Reliability (R) | 3.1 | 0.78 |
| Efficiency (E) | 3.1 | 0.78 |
| Prudence (Pr) | 3.7 | 0.93 |
| Discipline (D) | 3.1 | 0.78 |
| Rational behavior (RB) | 3.4 | 0.85 |
| Realistic assessment (RA) | 2.8 | 0.7 |
| Objectivity (O) | 4 | 1 |
| Critical thought (CT) | 3.1 | 0.78 |
| Logical thought (LT) | 4 | 1 |
| Consecutiveness (C) | 3.7 | 0.93 |
| Emotion (Em) | 1.3 | 0.33 |
| Impulsiveness (I) | 1.3 | 0.33 |
| Intuition (In) | 1.2 | 0.3 |
| Openness (Op) | 1.2 | 0.3 |
| Frivolous thought (FTh) | 1.6 | 0.4 |
| Subjectivity (S) | 1.1 | 0.28 |
| Spontaneity (SP) | 1.1 | 0.28 |
| Analogical thinking (ATh) | 1 | 0.25 |
| Morally appraising (MA) | 0.7 | 0.18 |
| Versatility (V) | 1.2 | 0.3 |
| Innovativeness (Inv) | 1.4 | 0.35 |
| Open Mindedness (OM) | 1.1 | 0.28 |

The exacerbating impact of cognitive indicators upon cognitive abilities and managerial activities in the *Administrative* cognitive category is presented in Figure 3. According to this figure the cognitive indicators with highest level of compatibility are: *Openness* (9), *Efficiency* (3), *Rational behavior* (10), *Discipline* (5), *Intuition* (8), *Reliability* (2), *Precision* (1) and *Consecutiveness* (13). In addition to these cognitive indicators high catalyst levels enjoy the following: *Morality* (16), *Analogical thought* (15), *Subjectivity* (19) and *Versatility* (23).

Figure 3

Compatibility of cognitive indicators and their level of catalysis in the Administrative category



In view of the delineated cognitive dependencies, the behavioral dimension of *openness* results in a managerial ability and preference to discuss the nature of managerial activities, the way they are executed, as well as the proclivity to share detailed information pertaining to the execution of all managerial goals and objectives. The behavioral output of *intuition* produces managerial abilities that help to foresee the trends of development and to envision the impact of key managerial factors upon managerial activities and process dynamics. *Morality* in turn typifies abilities that take into consideration the consequences of managerial decisions and the aftermath of their implementation upon organizational performance.

Analogical thought is another cognitive indicator that impacts managerial behavior but is less compatible with the cognitive abilities in the administrative category. This indicator inputs managerial activities that aim at balancing among various managerial tasks and outputs behavior that results in a reflective comparative analysis of managerial processes as well as in an adequate parallel assessment of managerial situations. *Subjectivity*, in turn, up-brings cognitive abilities that result in behavioral tendencies and managerial preferences that do not take into consideration all decision-making

alternatives and does not exhibit proclivity to conform to the opinion of the other management team members.

Versatility develops cognitive abilities the behavioral aspects of which helps managers identify a quick and adequate approach to various problem-solving managerial situations. This cognitive indicator increases managerial aptitude to cope with activities that do not correspond to their overall professional qualification. In the long run, however, the behavioral dimension of this cognitive indicator is not expected to have a sustainable impact on managerial activities taking place within this category. To a great extent this is due not only because of its low level of compatibility with the identified cognitive abilities but also because of the lack of managerial experience undermining the level of cognitive impact upon managerial performance. The levels of catalysis and compatibility of cognitive indicators, on the one hand, and their behavioral significance, on the other, are presented in Table 7.

Table 7

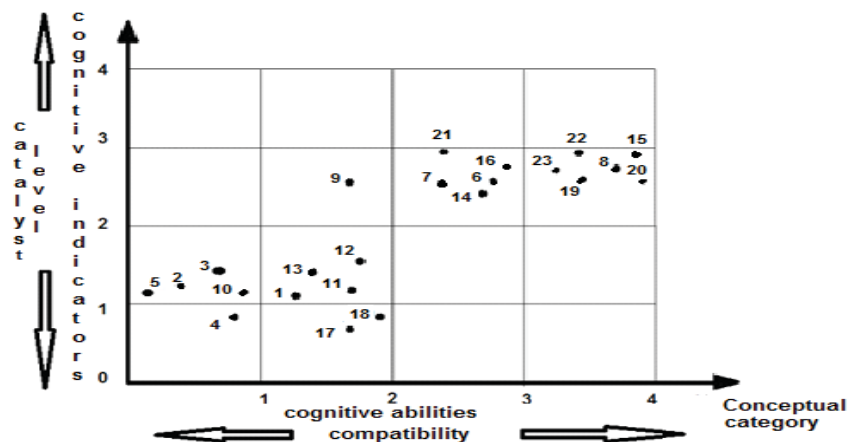
Catalyst and compatibility levels of cognitive indicators in the Administrative cognitive category

| Cognitive indicators (behavioral traits and characteristics) | Catalyst levels of cognitive indicators (from 0-4) | Level of compatibility between cognitive indicators and managerial activities in the Analytical category (from 0-1) |
|--|--|---|
| Precision (P) | 2.2 | 0.55 |
| Reliability (R) | 2.1 | 0.53 |
| Efficiency (E) | 2.4 | 0.60 |
| Prudence (Pr) | 1.6 | 0.40 |
| Discipline (D) | 2.2 | 0.55 |
| Rational behavior (RB) | 2.4 | 0.60 |
| Realistic assessment (RA) | 1.8 | 0.45 |
| Objectivity (O) | 1.7 | 0.43 |
| Critical thought (CT) | 1.9 | 0.48 |
| Logical thought (LT) | 1.4 | 0.35 |
| Consecutiveness (C) | 2 | 0.50 |
| Emotion (Em) | 1.6 | 0.40 |
| Impulsiveness (I) | 1.9 | 0.48 |
| Intuition (In) | 2.2 | 0.55 |
| Openness (Op) | 2.4 | 0.60 |
| Frivolous thought (FTh) | 1.7 | 0.43 |
| Subjectivity (S) | 2.1 | 0.53 |
| Spontaneity (SP) | 1.6 | 0.40 |
| Analogical thinking (ATh) | 2.2 | 0.55 |
| Morally appraising (MA) | 2.1 | 0.53 |
| Versatility (V) | 2.2 | 0.55 |
| Innovativeness (Inv) | 1.7 | 0.43 |
| Open Mindedness (OM) | 1.4 | 0.35 |

The impact of cognitive indicators upon managerial activities in the *Conceptual* cognitive category is exemplified on Figure 4. A closer look at this figure reveals that the indicators with strongest level of compatibility and catalysis with the managerial activities in this category are: *Spontaneity* (20), *Innovation* (22), *Analogical reasoning* (15), *Subjectivity* (19), *Versatility* (23), *Open Mindedness* (21), *Morality* (16), *Emotion* (6), *Impulsiveness* (7), *Frivolous thought* (14) and *Openness* (9).

Figure 4

Compatibility of cognitive indicators and their level of catalysis in the Conceptual category



Spontaneity results in development of cognitive abilities that yield tolerant human attitude. Behavioral preferences lead to managerial activities based on cause and effect interactions between organizational goals and managerial results. The purpose of such behavior is to capture the dynamics of managerial activities within the organization, as well as to extend practical recommendations as to the overall improvement of managerial processes. Behavioral aspects of *innovation* foster managerial practices that lead to swift dissolution of newly emerged and latent managerial problems. This cognitive indicator develops cognitive abilities that facilitate alternative seeking behavior and greater managerial elasticity in problem-solving situations. *Frivolous thought* often results in a more self-confident approach to decision-making. The behavioral dimension of this indicator is established on the level of conceptual understanding of the diverse in nature managerial activities.

Impulsiveness in turn stimulates cognitive abilities that transform into managerial behavior that is characterized by a greater degree of aggressiveness in the pursuit of all established organizational goals and objectives. The behavioral facet of this indicator introduces a robust managerial perspective when there is a clearly delineated managerial frame within which all responsibilities are unequivocally put in place. In case there are unclear organizational goals and

objectives managerial activities often lead to conflict situations. *Emotion-based* cognitive abilities exemplify managerial activities leading to a greater level of affiliation to existing managerial methods and principles. The behavioral dimension of *emotion* results in enhanced level of loyalty and human resources management strategies that set long-term business goals and objectives.

Table 8

Catalyst and compatibility levels of cognitive indicators in the Conceptual cognitive category

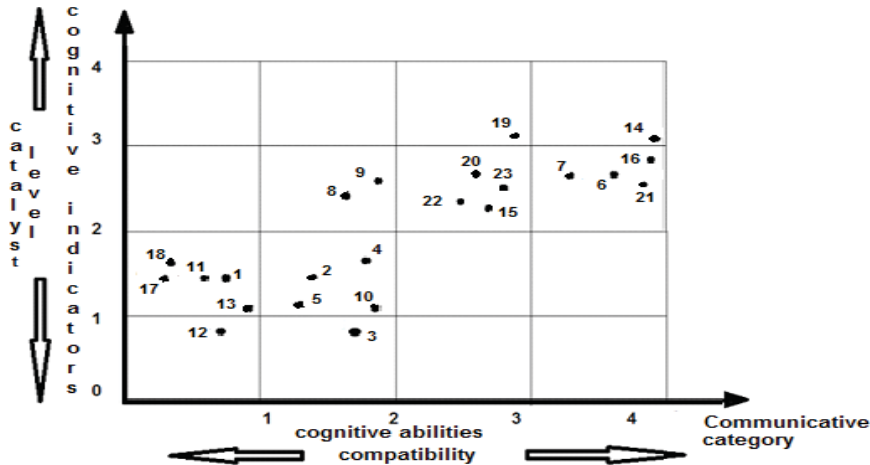
| Cognitive indicators (behavioral traits and characteristics) | Catalyst levels of cognitive indicators (from 0-4) | Level of compatibility between cognitive indicators and managerial activities in the Analytical category (from 0-1) |
|--|--|---|
| Precision (P) | 1 | 0.25 |
| Reliability (R) | 1.1 | 0.28 |
| Efficiency (E) | 1.4 | 0.35 |
| Prudence (Pr) | 0.9 | 0.23 |
| Discipline (D) | 1.1 | 0.28 |
| Rational behavior (RB) | 1.2 | 0.30 |
| Realistic assessment (RA) | 1.1 | 0.28 |
| Objectivity (O) | 0.7 | 0.18 |
| Critical thought (CT) | 1.6 | 0.40 |
| Logical thought (LT) | 0.9 | 0.23 |
| Consecutiveness (C) | 1.4 | 0.35 |
| Emotion (Em) | 2.6 | 0.65 |
| Impulsiveness (I) | 2.6 | 0.65 |
| Intuition (In) | 2.7 | 0.68 |
| Openness (Op) | 2.6 | 0.65 |
| Frivolous thought (FTh) | 2.4 | 0.60 |
| Subjectivity (S) | 2.6 | 0.65 |
| Spontaneity (SP) | 2.6 | 0.65 |
| Analogical thinking (ATh) | 2.9 | 0.73 |
| Morally appraising (MA) | 2.7 | 0.68 |
| Versatility (V) | 2.7 | 0.68 |
| Innovativeness (Inv) | 2.9 | 0.73 |
| Open Mindedness (OM) | 2.9 | 0.73 |

Open mindedness is a cognitive indicator that increases managerial propensity to secure a greater level of understanding of complex business issues and to compromise in the dissolution of multifarious managerial activities. Common managerial behavior in this respect seeks to implement well-established managerial methods and approaches in order to balance among various organizational activities. The level of catalysis and compatibility of cognitive indicators in the *Conceptual category*, on the one hand, and their behavioral significance, on the other, are presented in Table 8.

The impact level and compatibility of cognitive indicators upon managerial activities in the *Communicative cognitive category* are illustrated on Figure 5. The cognitive indicators with highest level of catalysis upon managerial activities adherent to this category include: *Frivolous thought* (14), *Moral appraisal* (16), *Open Mindedness* (21), *Emotion* (6), *Impulsiveness* (7), *Subjectivity* (19), *Spontaneity* (20), *Versatility* (23), *Analogical thought* (15); and *Innovativeness* (22). Strong catalysts with lower level of compatibility are the indicators *Openness* (9); and *Intuition* (8). The level of catalysis and compatibility of cognitive indicators in the *Communicative category*, on the one hand, and their behavioral significance, on the other, are presented in Table 9.

Figure 5

Compatibility of cognitive indicators and their level of catalysis in the Communicative category



Cognitive indicators, in general, and their level of compatibility and catalysis (behavior generating significance), in particular, settle cognitive abilities of the managerial staff and determine the preferred way of handling various business situations. As a result, they are of key significance when it comes down to enhancing managerial effectiveness. This is due to the fact that cognitive indicators frame the preferred way of information processing, develop managerial abilities and advance managerial behavior the effectiveness of which depends on its level of compatibility with managerial activities implemented within the organization. The level of interaction and interdependence between the studied cognitive indicators and abilities help determine the organic/DNA structure of managerial competencies – personality, team and organization-based competencies, as well as to determine their significance in the transformation of cognitive functioning into a sustainable managerial behavior.

Table 9

Catalyst and compatibility levels of cognitive indicators in the Communicative cognitive category

| Cognitive indicators (behavioral traits and characteristics) | Catalyst levels of cognitive indicators (from 0-4) | Level of compatibility between cognitive indicators and managerial activities in the Analytical category (from 0-1) |
|--|--|---|
| Precision (P) | 1.4 | 0.35 |
| Reliability (R) | 1.4 | 0.35 |
| Efficiency (E) | 0.9 | 0.23 |
| Prudence (Pr) | 1.6 | 0.40 |
| Discipline (D) | 1.1 | 0.28 |
| Rational behavior (RB) | 1 | 0.25 |
| Realistic assessment (RA) | 1.4 | 0.35 |
| Objectivity (O) | 1.4 | 0.35 |
| Critical thought (CT) | 0.9 | 0.23 |
| Logical thought (LT) | 1.4 | 0.35 |
| Consecutiveness (C) | 1 | 0.25 |
| Emotion (Em) | 2.7 | 0.68 |
| Impulsiveness (I) | 2.7 | 0.68 |
| Intuition (In) | 2.4 | 0.60 |
| Openness (Op) | 2.6 | 0.65 |
| Frivolous thought (FTh) | 3 | 0.75 |
| Subjectivity (S) | 3 | 0.75 |
| Spontaneity (SP) | 2.7 | 0.68 |
| Analogical thinking (ATh) | 2.3 | 0.58 |
| Morally appraising (MA) | 2.9 | 0.73 |
| Versatility (V) | 2.6 | 0.65 |
| Innovativeness (Inv) | 2.4 | 0.60 |
| Open Mindedness (OM) | 2.6 | 0.65 |

The preceding analysis helps the study advance a cognitive compatibility table. The purpose of this table is to determine the catalyst and valence levels of the studied cognitive indicators. While the level of catalysis serves as a measure of cognitive impact upon managerial behavior, the level of valence specifies the range of interaction possibilities for each one of these indicators. The difference in the levels of catalysis and valence for each one of the studied 23 cognitive indicators is presented in Table 10.

The results in this Table 10 suggest that the catalyst level of cognitive indicators enjoy the highest significance in the *Analytical cognitive category*. In contrast, the level of valence of these indicators in the same category is of lowest value. This cognitive observation leads to the conclusion that the behavioral output of managerial staff with *analytical cognitive abilities* is expected to result in a greater level of purpose and a higher degree of detail in the process of implementing their managerial activities and responsibilities. The behavioral dimension of cognitive indicators in the *Administrative*

category is contoured by a lower level of catalysis and comparably greater valence degree of the studied behavioral traits and characteristics. This in turn leads to a more intuitive behavior that reflects the level of practical experience and professional achievements of the managerial staff. When functioning in an environment characterized by a high degree of uncertainty managerial behavior leads to a sustainable outcome when it aims a higher degree of coordination of managerial activities rather than a greater level of scrutiny of organizational processes and managerial activities.

Table 10

Table of cognitive compatibility (catalysis) and valence of cognitive indicators

| | | | | | | | |
|-------------------------------|------------------------------|------------------------------|-------------------------------|------------------------------|-------------------------------|-------------------------------|-------------------------------|
| LT ₄₍₁₀₎ | O ₄₍₁₀₎ | P ₄₍₁₇₎ | C _{3.7(17)} | OM _{2.9(19)} | Inv _{2.9(19)} | Ath _{2.9(19)} | V _{2.7(19)} |
| Pr _{3.7(10)} | RB _{3.7(17)} | CT _{3.1(10)} | D _{3.1(10)} | MA _{2.7(19)} | In _{2.7(17)} | SP _{2.6(19)} | S _{2.6(19)} |
| E _{3.1(17)} | R _{3.1(17)} | RA _{2.8(10)} | FTh _{1.6(9)} | Op _{2.6(1)} | I _{2.6(19)} | Em _{2.6(19)} | Fth _{2.4(15)} |
| Inv _{1.4(14)} | I _{1.3(14)} | Em _{1.3(14)} | V _{1.2(9)} | CT _{1.6(20)} | C _{1.4(20)} | Em _{1.4(19)} | RB _{1.2(20)} |
| Op _{1.2(1)} | In _{1.2(1)} | OM _{1.1(14)} | SP _{1.1(14)} | RA _{1.1(20)} | D _{1.1(20)} | R _{1.1(20)} | P ₁₍₂₀₎ |
| S _{1.1(9)} | ATH ₁₍₉₎ | MA _{0.7(9)} | | LT _{0.9(20)} | Pr _{0.9(20)} | O _{0.7(20)} | |
| Op _{2.4(7)} | RB _{2.4(17)} | E _{2.4(17)} | V _{2.2(9)} | S ₃₍₁₉₎ | Fth ₃₍₁₉₎ | MA _{2.9(19)} | SP _{2.7(19)} |
| Ath _{2.2(9)} | In _{2.2(17)} | D _{2.2(17)} | P _{2.2(17)} | I _{2.7(19)} | Em _{2.7(19)} | OM _{2.6(19)} | V _{2.6(19)} |
| MA _{2.1(22)} | S _{2.1(22)} | R _{2.1(17)} | C ₂₍₁₇₎ | Op _{2.6(9)} | Inv _{2.4(19)} | In _{2.4(8)} | Ath _{2.3(19)} |
| I _{1.9(14)} | CT _{1.9(4)} | RA _{1.8(4)} | Inv _{1.7(14)} | Pr _{1.6(20)} | LT _{1.4(20)} | O _{1.4(20)} | RA _{1.4(20)} |
| Fth _{1.7(14)} | O _{1.7(4)} | SP _{1.6(14)} | Em _{1.6(14)} | R _{1.4(20)} | P _{1.4(20)} | D _{1.1(20)} | C ₁₍₂₀₎ |
| Pr _{1.6(24)} | OM _{1.4(14)} | LT _{1.4(4)} | | RB ₁₍₂₀₎ | CT _{0.9(20)} | E _{0.9(20)} | |

It is important to note that, within the administrative cognitive framework managerial behavior is normally stipulated by an array of external occurrences and circumstances rather than by an internally shaped and sustained conceptual understanding of managerial activities. This in turn results in frequent policy alterations and re-structuring of managerial activities that often dilute the benefit of existence of a well-coordinated approach to development of core business competencies. As a result, it is expected a lower degree of managerial effectiveness and organizational performance. Managerial efforts often lead to segregated problem-solving instances rather than to a well orchestrated organizational capacity-building solution. In view of the above, effective managerial behavior may be achieved in the short-run but is very unlikely in the long-run.

The high catalyst and valence levels of cognitive indicators in the *Conceptual cognitive category* are indicative of a well-balanced and progressively developing/ improving organizational performance. In contrast to the administrative cognitive category, the behavioral dimension of the studied cognitive indicators tugs high performing business processes and efficient managerial activities. This

entails managerial environment conducive to unfettered business performance and helps establish a progressive conceptual framework which propels responsible business practices. The inference of logical reasoning within this cognitive category leads to optimal solution to decision-making problems and well-balanced managerial activities. It fosters organizational performance that swiftly reacts, adapts or initiates adequate changes to the rapidly altering business environment. Thus managerial behavior often points into a business direction that facilitates the accomplishment of desired managerial results.

The high valence levels of cognitive indicators in the studied category create a behavioral outlet that stimulates goal-seeking managerial activities and effective managerial practices. In behavioral terms this is often accomplished by heightening the level of managerial interaction. The purpose of this interaction is not aiming at the resolution of a concrete problem or set of problems, but rather at concerting change management efforts. In its organic sense, change management is behaviorally perceived as a proactive means to achieving a new structural balance among organizational goals, objectives and activities. As a result of the behavioral propensity to seek optimal performance it is expected a smoother alteration of organizational dynamics and a reduction in the level of managerial stress and cataclysmic consequences in organizational performance.

Cognitive indicators' analysis in the *Communicative category* reveals a high valence and catalyst levels of behavioral traits and characteristics that give precedence to a more symbolic and less inquisitive managerial behavior. As a result, the behavioral dimension of managerial interaction aims at conveying pre-existing organizational goals and objectives rather than identifying the conceptual core and significance of environmental changes that cause alteration in the overall organizational dynamics. As a result, a sustainable development of managerial activities and processes is possible when the managerial staff enjoy unique competences and a high level of professional expertise, whereas the organization is an industry leader and enjoys high competitive advantages. In case these environmental conditions are not in place it is very likely that the initiated managerial activities and organizational processes will prove to be incompatible with the real organizational priorities and environmental dynamics. This in turn will result in impoverished managerial outcome, spiflicate human resources' potential for development and deteriorate the overall organizational performance. In the long run, the aforementioned imbalances are expected to downscale the possibilities for business growth and development, steer the organization away from its realistically set managerial goals and objectives and stipulate inadequate showcase of managerial expertise.

The lack of clear managerial concept and developmental vision frequently results in irrational managerial judgment and profusion of organizational resources. Thus the organization inflicts upon itself diminishing returns, low managerial utility and effectiveness. The diminishing returns on investment and organizational capacity building create a sluggish ground for organizational growth and often serve as a prerequisite for dwindling operational utility. Such business instances

widen the developmental gap and makes it almost impossible for an organization to recover from its impoverished performance. Managerial efforts in this respect often boil down to flicks in managerial foresight rather than a well-grounded methodological and conceptual base for organizational development.

*

This study analyzes cognitive functioning and its behavioral transformation at the micro-cognitive level. Subject of research are exponential cognitive frames and abilities, as well as their behavioral output and impact upon managerial activities. The research findings reveal the level of compatibility, valence and catalysis of the studied cognitive indicators. Their behavioral output is systemized in four basic cognitive categories - *Analytical, Administrative, Conceptual and Communicative*. On this ground the study exposes the catalyst level and valence of each one of the 23 cognitive indicators in the respective cognitive category. The study reaches the conclusion that managerial effectiveness is contingent upon our understanding of the behavioral impact of cognitive indicators upon managerial activities.

The study unveils a new research venue in the cognitive functioning domain. In particular, it carries forward the understanding that the level of catalysis and valence determine the number of possible interrelations among cognitive indicators, which in turn fabricates/formulates managerial competences and activities. Thus the behavioral output of cognitive indicators specify the level of managerial effectiveness. In this sense cognitive functioning is not based on fixed cognitive structures but rather on a dynamic meta system's interplay between cognitive abilities, competencies and approaches.

References:

- Hadjiev, V.* (2012). Cognitive topology and managerial behavior. "Economic World" Press, Svishtov: "D.A. Tzenov" (in Bulgarian).
- Hadjiev, V.* (2011). Cognitive approaches and models. - "Narodnostopanski Archive" Journal, Svishtov: "D.A. Tzenov", (2) (in Bulgarian).
- Cassidy, S.* (2004). Learning Styles: An overview of theories, models and measures. - Educational Psychology, (24).
- Cattell, R. B., H. W. Eber, and M. M. Tatsouka* (1970). Handbook for the Sixteen Personality Factor Questionnaire 16PF. Champaign, Ill.: IPAT.
- Hermann, N.* (1994). The creative brain (Fifth edition). Lake Luke, NC: Brain books.
- Kozhevnikov, M.* (2007). Cognitive styles in the context of modern psychology. - Psychological Bulletin, (133) 3.
- Leonard, D. and S. Straus* (1997). Putting your companies whole brain to work. - Harvard Business Review, (75).
- Myers, I. B., M. H. McCaulley, N. L. Quenk, and A. L. Hammer* (2003). Myers-Briggs Type Indicator manual. Palo Alto, CA: Consulting Psychologists Press.
- Myers, P. and K.Mayers*, (1998). Myers-Briggs Type Indicator (European English edition). Palo Alto, CA: Consulting Psychologist Press.
- Mintzberg, H.* (1976). Planning on the left side and managing on the right. - Harvard Business Review (54).

29.XI.2012