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# EMPLOYEES BRAIN DOMINANCE THINKING STYLE OF ARAB POTASH COMPANY

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## *ABSTRACT*

*The aim of the study was to identify the value of the thinking Style for brain dominance and the impact of its relationship in making the project management and job preference of the employees of the Arab Potash Company, which were (111) employees chosen for this study. The SPSS (version 16) was used to analyze the data, using different statistical methods (percentages, frequencies, arithmetic mean, standard deviation, chi-square value based on the fit of goodness, t-test, and Pearson correlation coefficient). The main results analysis showed that the prevalence of single dominance among employees was (62.2%), with (28.8%) in type (A) followed by double dominance (32.4%) in the styles of (AB) and, finally the triple dominance (5.4%) specifically in the (ABC) pattern. The statistical analysis showed that the significant differences between the power preference of thinking styles and type of job in type (A), while the absence of differences in the rest of the styles, and the existence of statistically significant differences at the same level type (A) according to the work department. Also a negative correlation between some types of thinking styles pairs that were not favored in the type of such a company. Finally, the results revealed that the possibility of increasing and decreasing the negative correlation between thinking styles in stressful work situations under high pressure. In the light of these results, some important points were recommended for motivating the employees of the potash company to identify the subject of thinking styles to know their strengths and weaknesses in work and the impact on dealing with the rest of the employees and its reflection on the productivity of the company and reducing the conflicts among them, through training courses in order to encourage each employee to increase the use of a quarter of his/her brain in accordance with. Also its required function, also recommended that the Herrmann scale may be used as a tool for recruiting and setting up teams work from the principle of "the right man in the right place" and to renew the HBDI database for employees for each period.*

***KEYWORDS:*** *Thinking Style, Power of Preferences, Employees, Brain Quadrants, Herrmann Scale*

***Article History***

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**ABBREVIATIONS:** HBDI= Herrmann Brain dominance Instrument, A= upper left of brain, B = lower left, C = lower right, D = upper right

## INTRODUCTION

Thinking in its simplest form is defined as a series of continuous mental activities performed by the brain when exposed to a sensation coming from the senses, which does not stop as long as the human being is awake. Therefore, thinking is a natural function of the brain, which is a gift from God to the human being to continue its existence, which reflects in the reconstruction of the universe and its development, which is a developmental phenomenon that develops across different stages of life, which reflect the complexity of the human mind and its uniqueness and complexity

of operations. The problems become more difficult and complicated by the development of society and its rapid changes, the general meaning of thinking includes all types of mental activity or cognitive behavior, which is characterized by the use of symbols in the treatment of things and events rather than addressed by the apparent physical activity. In (De Bono, 2003) the meaning of thinking is exploring experience with a goal of reaching specific goals. This goal or goals may be to achieve understanding, to make a decision, to solve a problem, to judge things or to do something in order to enjoy and accomplish. Also (Paul,1984) confirms that there are two levels of thinking: the simple level, which includes skills such as observation, acquisition, understanding and remembering of knowledge, comparisons and classifications, simple analysis and synthesis skills, complex level of critique and judgment, and the deposit of ideas, solutions and alternatives, the processes of planning and thought, and solving problems. Thinking in general needs to be raised through a happening or asking questions or a problem that challenges the individual's mind and moves and motivates his motivation, and he has the motivation to think and try to find a solution to this problem. According to brain theory, thinking and learning were parallel. Learning is thinking, thinking occurs in the cerebral cortex, whether on the left side or the right side of the brain. The neurological trend confirmed that thinking occurs as a result of physical growth of the brain. Talking about learning means talking about thinking and talking about thinking, it means talking about brain physiology and how to increase the physical growth of the brain and thus increase learning (Sousa, 2001). There are those who say that "Cognitive activity works to give environmental features meaning and permanence through the cognitive environment to help the individual adapt with considerations, to increase the ability of staff to meet the environmental challenges with high flexibility" (McGee A, 2009). Educational systems at the family, school or culture levels develop the abilities of the left half of the brain through attention to language skills, analysis, logic and accuracy at the expense of the right half, which is limited to dealing with it in times of hobbies, most often associated with imaginations, creativity and activities, the visual process and free thinking. Zheunikov M.,2007, emphasizes that one of the most important reasons for focusing on the development of the left side is not only knowing the brain and how it works, and indicating that many of the problems we face while using our mental abilities do not stem from lack of but also an incorrect knowledge of these abilities and how they are used, our understanding of the structure of the brain and how it works may help to overcome these difficulties, it also helps to reduce the sense of distrust that most people feel when it comes to investing the mental abilities we have. Ann Herrmann Nehdi,2012, chief executive officer of world-renowned Herrmann International, believes that projects often fail not because of lack of effective project management processes, tools, and techniques but rather because of the quality of thinking that gets in the way of applying them on our projects. Our thinking preferences determine how we make decisions, solve problems, collaborate with others, and ultimately the kind of results we get.

## Importance of the Study

The importance of this study lies in helping individuals and organization to increase productivity, motivate the employees, and identify accuracy about work specification, employee preparation, and creativity. Finally, transform the "difference between individuals" into a creative force, improvement their effectiveness and make them work in a team spirit, to achieving the message of the organization which they are attached. The subject of thinking styles and the whole brain project management is gain importance, because it is one of the important studies that extended to the reality of the work in the organizations in practice. It is believed that in the developing countries it is still facing problems whose source is associated with a clear failure to understand the importance of thinking methods and their effect on making the administration integrated, to be the catalyst to rush to reveal the features of the way that can be taken by the organizations in these countries to find their place in the midst of competition, both at the local or international level.

## Problem of the Study

Ann Louis de Boer and etal, 2013 says: our knowledge of the functioning brain has not only increased more over the past 40 years than in all previous centuries together but is also still evolving. It has long been recognized that people vary significantly in their styles of thinking, and models have been created in an attempt to capture these differences. Usually occurs misunderstanding between the team and the manager or team with each other, the reason is attributed to the difference between preference thinking for people themselves. The individuals do his work without love for him, because the quarter predominates in their brain does not fit with him, so this leads to conflict managing between the team and the manager,and the waste of time to solve a conflict,and delay in production. In any project management process, one should acknowledge that thinking style diversity will be evident throughout the different phases of the project. Understanding the mental diversity of each team member will not only improve team effectiveness but ultimately promote the quality of the end result. (Wysocki,2002) ascribes the failure of projects to inadequate communication, ineffective use of the project team and inappropriate project management processes.

## Objectives of the Study

The aim of this research is to attempt to analyze the impact of the Employees Brain Dominance Thinking Style of Arab Potash Company on projects and make them in whole brain management status, so from this goal have sub following objectives:

- To reveal the dominant thinking styles of the research community, and to compare what the research community requires and what the sample provides.
- To gain the preference power of thinking style and their differences depending on the job and the department of work.
- To detect a difference in the use of style for another style in the research sample and their impact on the target of the work department.
- To find out the relationship between thinking styles in the research sample and to knowledge their impact on cooperation among them at work.
- To test the sample of the research are they susceptible to shift their preferred thinking methods under work stress?
- To find out the number of employees has adapted their thinking profile to their job profile.

## Questions of the Study

The researchers attempt to display the research problem and determine its dimensions by answering the following questions:

- What the style of thinking is prevalent in the research community in general, and in particular of its sections?
- Does the preference power of styles to the research sample vary by the job? And the work section?
- Are there differences in use between dominant thinking styles pairs in the research sample?
- What the nature of the relationship between the thinking styles of the research sample, and what is their impact on cooperation among them at work?

- Are the research sample susceptible to (shift /change) their preferred thinking styles under work stress?
- Are the profiles of research sample rare or common?

## Principles of Thinking Styles

They are many principles to the thinking styles subject according to (Sternberg, 2004):

- The styles are preferences in the use of capabilities rather than the abilities themselves, and the agreement between styles and abilities creates a good type of successful integration, which is better than employing them individually.
- Individuals have profiles or a set of styles, not just one style.
- There are no good and bad styles of thinking, but there are some styles that are appropriate to a particular situation and are not commensurate with other situations.
- Individuals differ in their power of preference and in their stylistic flexibility.
- These styles are subjected to change depending on the different stages of life, although they are relatively stable.
- 6-The styles thinking are measurable and can be taught by a Herrmann (120) paragraph measures of thinking styles

## Classification of Thinking Styles

Previous studies showed that there are many types of thinking styles that are different from one another. Harrison and Bramson,1982 described the modes of thinking into five patterns (structural, ideal, practical, analytical and realistic), so that each class has strengths and weaknesses. Thinking methods can be divided into thirteen methods fall within five fields, which are:-

- Functional side (Legislative, Executive, and Judicial Style).
- 2 Formal aspect (Monarchical, Hierarchical, Oligarchic, and Anarchic Style).
- Level aspect (Global and Local Style).
- Extent Aspect (Internal and External Style).
- Tendency aspect (Liberal and Conservation Style).

Ann Herrmann Nehdi, 2002 acknowledged in literature as the father of brain dominance technology (Morris, 2006), focused his initial research not on brain dominance, but on understanding how the creativity of the human brain is unleashed. His valuable contribution to brain research during the 1990s involves his documentation of the fact that the human brain comprises four distinct learning modes and not only two hemispheres, where each of the modes has its own ways of processing information and functioning (Herrmann, 1995). Figure (1) is a schematic representation of Herrmann's metaphoric whole brain model and functions associated with each part. Herrmann synthesized what styles of thinking to be required to understand it more and placed it in the table (1), (Profile Picture, Skills, Positive, Negative Aspects, How to increase preference dominance, and How to Learn).

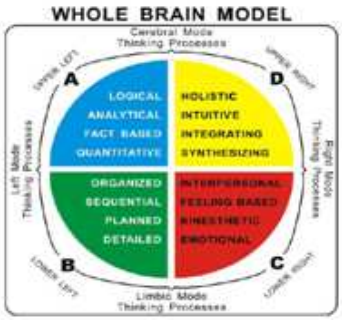
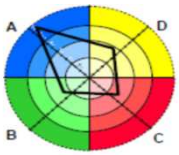
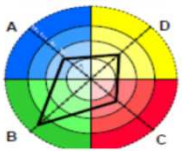
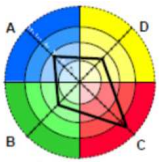
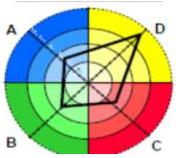



**Figure 1: Herrmann's Whole Brain Model (Herrmann 2001)**

**Table 1: Differences in Processing Modes (Bunderson C., 2005)**

| | A<br>Upper Left/Blue | B<br>Lower Left/Green | C<br>Lower Right/Red | D<br>Upper Right/Yellow |
|---|---|---|---|---|
| **Profile Picture** |  |  |  |  |
| **Skills** | Problem -solving<br>Analytical<br>Statistical<br>Technical<br>Scientific<br>Financial | Planning<br>Regulatory<br>Supervisory<br>Administrative<br>Organizational<br>Implementation | Expressing ideas<br>Interpersonal<br>Writing<br>Teaching<br>Training | Integrative<br>Visualizing<br>Causing change<br>Conceptualizing<br>Generating ideas<br>Trusting intuition |
| **Positive Aspects** | Solve problems logically<br>Deal with facts<br>Output are data and statistics<br>Deal with techniques<br>Focus on final goal<br>Evaluated results<br>Making tough decisions without emotion | Learning through organized work<br>Loves operational field work<br>Focus on procedures& details<br>concerns chronological and historical chronology<br>conservative | Love Cooperative work Seeking to communicate with others<br>Spiritual and moral commitment | Brainstorming<br>Integrate concepts into something new<br>improvised<br>Tends to risk and challenge<br>Interested in the future |
| **Negative Aspects** | avenger<br>Arguing a lot<br>Do not listen to anyone<br>Commander and ruler<br>Make fun of thinking C | Very cautious<br>routine<br>not flexible<br>Head<br>Careful | Very courteous<br>Follow others<br>hesitant<br>unorganized<br>very sensitive | Not compliant with laws<br>Overpriced and adventurous<br>Dispersed and messy<br>Depends on guesswork<br>Annoying |
| **How to increase preference dominance** | Decision-making during logical analysis<br>Search for facts and evidence<br>Give importance to numbers and data | Record daily activities and times<br>Arranging papers and envelopes<br>Keep in the organization's instruction manual<br>Work to reach the | Build relationships with others<br>Expect the needs of others<br>Maintain continuity in the relationship<br>Be proactive and | Make sense and intuition in perception<br>Do not be routine in your life<br>Do more work at the same time<br>Do not bother with the details<br>Be adventurous and challenging<br>Do not abide by laws that limit your thinking |

| | | | | |
|---|---|---|---|---|
| | **Owning extensive knowledge about scientific and technical subjects<br>Thinking and reasoning is far from emotion<br>Provide evidence** | **result<br>Setting goals and strategies** | **volunteer<br>Help others solve their problems** | |
| **How to Learn** | **Acquiring & Quantifying facts<br>Analysis & Logic<br>Building Cases<br>Forming Theories<br>Thinking through Ideas** | **Organizing & Structuring Content<br>Evaluating and Testing Theories<br>Practice<br>Implementing Content** | **Listening & Sharing ideas integrating Experiences with Self<br>Moving & Feeling Emotional Involvement<br>Harmonizing with Content** | **Taking Initiatives<br>Exploring hidden possibilities<br>Relying on Intuition<br>Constructing Concepts<br>Synthesizing Content** |

**Aspects of the Profiles:** The data were complemented by an explanation report that describes and highlights important aspects of the profile in order to understand the profile, it is important to explain (quadrants and modes of thinking, the preference code, the adjective pair data, the profile score) shown in Figure (2)

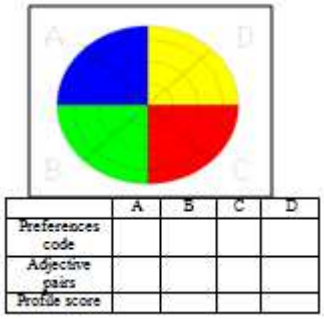



**Figure 2: Output Data (Herrmann 2001)**

**Table 2**

| | A | B | C | D |
|---|---|---|---|---|
| Preferences code | | | | |
| Adjective pairs | | | | |
| Profile score | | | | |

## Quadrants and Modes of Thinking

Thinking preferences are measured not only by the four quadrants (A, B, C or D) but also by four modes (upper left, lower left, upper right and lower right). The upper modes right and left, combining quadrants (A and D) quadrants, are more cognitive and intellectual, preferring thinking in abstract, conceptual modes. The lower modes combining the (B and C) quadrants are grounded and emotional in nature. These modes often prefer visceral, "gut" and concrete approaches (Herrmann International, 2009). The figure 3 below showed all the above management styles of single and double dominant managers using the Herrmann model in summary.

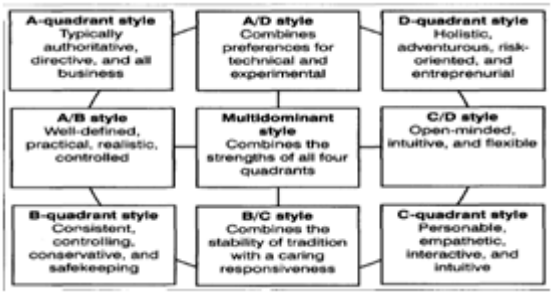



**Figure 3: Management Styles of Single and Double-Dominant Managers Model (Lewis, 2001)**

## The Preference Code

The preference code is a categorization of the profiles and is helpful in identifying generally similar profile configurations; see Figure (3), where:

- A code (1) corresponds to a preference (a numerical value of 67-99). Visibility of a strong preference typically will be associated with a numerical value of (100) or more (Herrmann, 2002).
- A code (2) corresponds to an intermediate preference of generally being comfortable to use the thinking activities of the (a numerical value between 34 and 66).
- A code (3) indicates a low preference or even lack of interest for that specific quadrant's thinking and for some cases even avoidance (a numerical value of 33 or below) (Herrmann, 1996; Herrmann International, 2009).


**Figure 4: Distributing Power of Preferences (Herrmann, 1996)**

## The Adjective Pair Data

These data derived from the forced choice pairing section in the HBDI survey and reveals the thinking style distribution that is most instinctive to the individual. The adjective pair data help indicate the individual's 'backup' style of preferred thinking. There are (24 pairs), and therefore twenty-four points distributed between the four quadrants. The highest score (maximum 12) typically reveals the thinking styles favored in 'pressured' or stressful situations, which may differ from the preferred style. The distribution of responses into (A, B,C, and D) quadrants under pressure could therefore also indicate perhaps a less preferred quadrant becoming more dominant or a generally preferred one receding into the background (Herrmann International, 2009).

## Communicate Between People According to Dominant Quadrant

The followings cases will be studied:-

- **Single Dominant Profiles:** Single dominant profiles of the more than three million profiles in Herrmann's database,(only5 % of the profiles are for a single dominance). The single dominance can occur across all the four quadrants, with a preference code of (1222, 2122, 2212 or 2221 ) (Boer,2013).
- **Double Dominant Profiles:** A majority of people (58 % of profiles in Herrmann's database international, 2009 have a preference for two quadrants). Double dominance can occur between left 1122, right 2211, upper 1221 or lower 2112 with the advantage being that the two quadrants tend to reinforce each other.
- **Triple Dominant Profiles:** A high percentage of (34 % of the profiles in the database shows a triple dominance). Within this total, 2111, 1121 and 1112 are the most frequent profiles, (representing 81% of the triple dominant profiles, Herrmann, 1995; Herrmann International, 2009). These profiles have only one quadrant that is not a primary.
- **Quadruple Dominant Profiles:** This profile makes up( 3 % of the profiles present in Herrmann's database), the 1111 profile is a true multi dominant profile. The profile expresses primary levels for every one of the four quadrants and offers enormous potential for highly integrated, varied thinking processes. These possibilities are summarized in Figure (5).

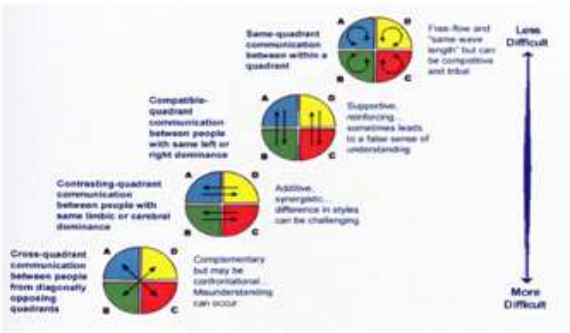



**Figure 5: Brain Dominance Impact on Communication between People (Humaidi, 2005)**

## Definition of an Alignment Gap

An alignment gap is any variance between what the project requires and what the team provides. t can be either a positive or a negative alignment gap. A positive alignment gap arises when the team provides more of a skill or characteristic or style preference than the project requires (Herrmann, 2001). Figure (5) shows a project and project team profile that, the researcher will use as an example for this section.

## Population of the Study

Identifying the sector in which research is being conducted is critical. The Arab Potash Company was chosen as a research society, where the study community has (146) employees distributing on three departments, consists of administrative, engineering and technical staff, who form different working groups with each otherand have different purposes.

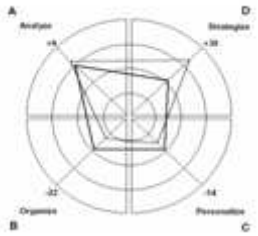


**Figure 6: Example of Alignment Gap Project Profile ( Hermann N., 2001)**

**Sample of the Study:** The selection of a purposive sample (top-level managers, middle-level managers, engineers, technicians, foremen, and secretaries was (111) employee out of a total of (146) employee, equivalent (76.03%) of the total sample in the organization being investigated. Based on this, the sample included all the employees who work in the different departments of the company from (the projects department, the planning department, and the maintenance department). Table (2) describes details of the distribution of the research community according to the job and the distribution of the distributed forms

**Table 3: Details of the Sample Study**

| Job | | | | | | Total | Sample of Study (Forms) | | (%) the Research Sample of the Total Sample |
|---|---|---|---|---|---|---|---|---|---|
| Top Level Managers | Middle Level Managers | Engineers | Technicians | Foremen | Secretaries | | Distributed | Received | |
| 12 | 18 | 36 | 27 | 13 | 5 | 111 | 146 | 111 | 76.03% |

Table (2) shows the study sample included various specialties in different types of jobs, the top level management function consisted of (administrative managers, technical managers, project managers, generals managers) and the middle-level management function (procurement coordinators, superintendents of officers and projects), the engineers specialized in the company, including (civil engineers, electric engineers, control and monitoring engineers, mechanic engineers, specialist quantity engineer, concrete/steel engineers, material planning engineers, inspection engineers, costing/budget engineers, surveyor engineers), and also contained technicians and foremen who occupy several places in various fields in the company, finally secretaries they consist of (documents controller, archiving documentation). The projects department in the company had a large proportion of the study sample with a high number of employees are (73) employee accounted about (65.7%), followed by the maintenance department with (22) employee accounted about (19.8%), followed by the planning and reliability department have (16) employee accounted about (14.5%), the following table shows the distribution of staff in each department according to their jobs.

**Table 4: Distribution of Staff in Each Department According their Jobs**

| | Types of Job | | | | | | |
|---|---|---|---|---|---|---|---|
| | Top Level Managers | Middle Level Managers | Engineers | Technicians | Foremen | Secretaries | Total |
| **Projects Department** | | | | | | | |
| Number | 9 | 12 | 21 | 21 | 7 | 3 | 73 |
| Percent% | 12.3% | 16.4% | 28.7% | 28.7% | 9.5% | 4.1% | 100% |
| **Planning and Reliability Department** | | | | | | | |
| Number | 2 | 3 | 10 | - | - | 1 | 16 |
| Percent% | 12.5% | 18.8% | 62.5% | - | - | 6.25% | 100% |
| **Maintenance Department** | | | | | | | |
| Number | 1 | 3 | 5 | 6 | 6 | 1 | 22 |
| Percent% | 4.5% | 13.6% | 22.7% | 27.2% | 27.2% | 4.5% | 100% |

**Instrument of the Research:** In order to achieve this study, the data collection process was based on the following tools:Theoretical framework: In order to enrich the theoretical side of the research, it was based on the contributions of writers and researchers collected from the sources represented by (scientific references of books, magazines, papers, researches, and scientific studies) and network (Internet).

## Field Framework Tools

The field side coverage has been adopted to discuss a number of necessary means in collecting data and information related to this aspect of the research :

- Personal interview: to find out more closely from the specialists about some of the details contained in the questionnaire, the researcher conducted a number of personal interviews with the study community in the organization in question.
- The questionnaire of study: a questionnaire was the basic source adopted by the researcher in obtaining information related to the practical aspect. The independent variable was adopted by the (Hermann brain dominance instrument)

## Variables of the Study

Independent variable: Brain dominance and thinking preferences, these are variables thatthought toaffectto the dependent variable, It is a variable manipulated by the researcher to see if the change with it leads tochanges of the dependent variable Dependent variables: Make integrated Projects and building the effective project team, here is the focus of the researcher's interest to see the changes that occur in this variable due to the effect of the independent variable.

## Statistical Processing

Due to the nature of the present work variables the descriptive analysis will be used to draw the staff profiles according to the literal view, HBDI circles were drawn through the Auto-CAD software and also used the statistical package SPSS in which the following statistical methods were used:-

Statistical methods (arithmetic mean, standard deviation, median) to describe the distribution of employees across the company, according to their prevailing thinking, and once again distribute them to the three divisions of the company.

Chi-squared test, to test the statistical significance of differences in the power of the use of thinking patterns for the sample study depending on the job variable and the variable of the work division.

T-test, to detect the significance of statistical differences between all pairs of thinking patterns of employees in general and then each section separately.

Pearson correlation coefficient will be used to find out the relationship between patterns pairs of thinking for employees, are the relationship negative or positive? and then each section separately, also to know if the preferred thinking styles of employees are susceptible (change/shift) during work under pressure?

Frequencies and percentages, to describe the distribution of employees according to their dominant thinking styles (single dominant, double etc), to indicate the number of employees who conformed their style of thinking to their job patterns.

## DISCUSSIONS OF RESULTS

This section includes the statistical analysis of the of the answers of employees to two sample questions of seven questions of this study, which aims to make the project management in whole brain status, and to achieve this goal of this work by applying the Herrmann scale of brain dominance, the following are samples of these results in different departments of the company.

### (A) Results Related to the Question: What is the Dominant Thinking Style of Employees of the Arab Potash Company?

To answer this question, the HBDI survey was administered to (111) employees in the company following the instructions in the published manual. The values of the Mean, Standard Deviation and Median were calculated for all types of styles thinking. The following table shows the results:

**Table 5: Summary Statistics of the A-B-C-D Distributions for All Employees**

| | A | B | C | D |
|---|---|---|---|---|
| **Mean** | **59.65** | **53.89** | **50.36** | **49.25** |
| **Standard Deviation** | **23.06** | **21.21** | **20.63** | **18.82** |
| **Median** | **70** | **56** | **53** | **51** |

Table (4) shows that the style of thinking (A) is prevalent among the staff of the potash company, ranked at mean of (59.65) and a standard deviation (23.06), followed the style of thinking (B) with mean of (53.89) and a standard deviation (21.12), then style thinking (C) with mean (50.36) and standard deviation (20.63), and finally the style of thinking (D) with mean (49.25) and standard deviation (18.82). The resulting data profiles under the four quadrants making up the HBDI profile are shown in figure ( 6) below. The distributions of the **A, B, C, D** quadrants scores are relatively free from skew, So the (A) and (B) distributions generally show higher scores, and higher mean scores than the (C) and (D) distributions**.** Although it is useful to summarise the average values and dispersion of frequency distribution in Table (6), it should not divert attention from the frequency distribution profiles and tabular data shown in Figure (6). For example, although the A (blue) profile has a slightly higher mean than the B (green) distribution, the two graphs have a very similar shape in the spread of scores. A similar remark can be made about the (C) and (D) distributions which closely resemble each other. However, although (A) and (B) profiles are placed higher on HBDI scores, there is considerable overlap in values with the (C) and (D) distributions. Hence among individuals, there can be, and are, diverse A, B, C, D profiles. Indeed Herrmann mentions that "the closer the alignment between mental preference and job requirements, the more likely is job success and satisfaction". Thought he actual distributions of normed profiles for occupations have not been published, and Herrmann's samples have largely involved Western and Hispanic cultures, he considers that scores on a thinking preference above (100) are "Very High", and scores below (50) are "Low". Scores of (50-85) are "Moderate", and (86-99) are considered to be "High". This vocabulary will be followed in the thesis though the grouping of profile scores (Figure-6) will differentiate classes with smaller ranges of scores. In this very high category ( see Figure 6) the A,B,C and D quadrants are zeroemployees. In contrast, in the lower classes (below a score of 50) the (A) and (B) distributions contain 31 and 37 employees respectively, whereas the (C) and (D) scales contain 50 and 54 employees respectively. To facilitate the answer to this question by HBDI physiology, we drew the (111) profile brain to each one and grouped together showing in Figure (7). In the left side of Figure is a reflection of the composite profile of the project team. The composite profile of the team does not focus on the individual contributions of each member, but on the pattern

displayed by the whole team, and in the right side of samefigureshows theteam members' group average. Simply the average of the data provides a less cluttered presentation of the team profile within a single kite. The preference map of the project team shows the all styles thinking **A,B,C,D** in intermediate preference (34-66) (i.e. using quadrants), and no quarter in strongly preference. From the definition of alignment project/team model gap, we established the project profile of the Arab potash company according to their objectives and their scope and success criteria, it is an engineering company with a productive industrial character has many projects that analyze it with high logic, monitor, plan and implement them regularly. These qualities fall into the pattern of thinking (A) and (B) in a strongly preference degree. Although the figures show a collaborative spirit and imaginative flair are not downplayed in the aims of the company and the requirements of its workforce.

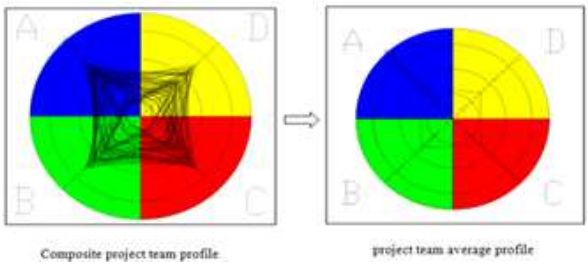



**Figure 7: HBDI Circle Explaination**

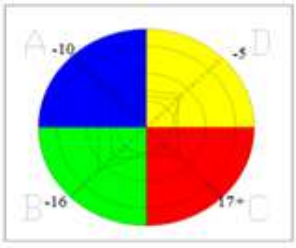



**Figure 8: Alignment Gap of Project Profile and Average Profiles for All Employees in Company**

The above figure shows the company needs monitoring action required in style thinking of (A) and (B) to increase them, and monitoring action required in style of thinking (C) to reduce them, and no action required in (D) thinking style.

**The Projects Department:** The HBDI survey was administered to (73) employees in the projects department of the company following the instructions in the published manual. The values of the Mean, Standard Deviation and Median were calculated for all types of styles thinking, the following table shows the results:

**Table 6: Summary Statistics of the A-B-C-D Distributions for Employees of Projects Department**

| | A | B | C | D |
|---|---|---|---|---|
| **Mean** | **59.61** | **52.6** | **50.57** | **49.26** |
| **Standard Deviation** | **23.14** | **21.88** | **20.57** | **19.51** |
| **Median** | **70** | **56** | **53** | **48** |

Table (5) shows that the style of thinking (A) is prevalent among the staff of the projects department, ranked at mean of (59.61) and a standard deviation (23.14), followed the style of thinking (B) with mean of (52.6) and a standard deviation (21.88), then style thinking (C) with mean (50.57) and standard deviation (20.57), and finally the style of thinking (D) with mean (49.26) and standard deviation (19.51). The resulting data profiles under the four quadrants making up the HBDI profile are shown in figure ( 9) below


**Figure 9: Strength of Employees Thinking Preferences in the Projects Department**

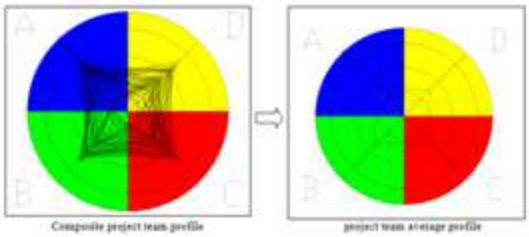


**Figure 10: HBDI Circle Explanation**

The distributions of the **A, B, C, D** quadrants scores are relatively free from skew, so the (A) and (B) distributions generally show higher scores, and higher mean scores than the (C) and (D) distributions**.** In this very high category (see Figure 9) the A, B, C and D quadrants are zerosemployees. In contrast, in the lower classes (below a score of 50) the (A) and (B) distributions contain 20 and 25 employees respectively, whereas the (C) and (D) scales contain 33 and 37 employees respectively**.** To facilitate the answer to this question in this departmentby HBDI physiology, we drew the (73) profile brain to each one and grouped together showing in Figure (10). The preference map of the project team in projects department shows all styles thinking **A,B,C,D** in intermediate preference (34-66) means in using status, and no quarterin strongly preference. Weestablished the profile of the projects department ofcompany according to their objectives and their scope and success criteria, it is an engineering department with a structure buildings character has many projects that analyze it with high logic, monitor, plan and implement them regularly. These qualities fall into the pattern of thinking (A) and (B) in strongly preference degree, although showing a collaborative spirit and imaginative flair are not downplayed in the aims of this departmentand the requirements of its workforce.

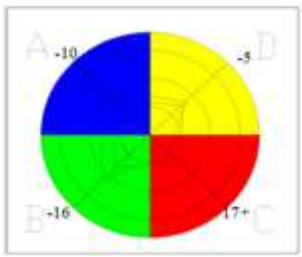



**Figure 11: Alignment Gap of Project Profile and Average Profiles for Projects Employees in Company**

The above figure shows the projects department of the company need monitoring action required in style thinking of (A) and (B) to increase them, and monitoring action required in style of thinking (C) to reduce them, and no action required in (D) thinking style.

The Planning and Reliability Department: The HBDI survey was administered to (16) employees in planning and reliability department of the company following the instructions in the published manual. The values of the Mean,Standard

Deviation and Median were calculated for all types of styles thinking, the following table shows the results:

**Table 7: Summary Statistics of the A-B-C-D Distributions for Employees of Planning & Reliability Department**

| | A | B | C | D |
|---|---|---|---|---|
| **Mean** | **65.18** | **55.56** | **54.56** | **44.68** |
| **Standard deviation** | **18.87** | **21.85** | **18.9** | **17.73** |
| **median** | **72** | **62** | **61** | **48** |

Table (6) shows that the style of thinking (A) is prevalent among the staff of the planning and reliability department, ranked at mean of (65.18) and a standard deviation (18.87), followed the style of thinking (B) with mean of (55.56) and a standard deviation (21.85), then style thinking (C) with mean (54.56) and standard deviation (18.9), and finally the style of thinking (D) with mean (44.68) and standard deviation (17.73). The resulting data profiles under the four quadrants making up the HBDI profile are shown in Figure ( 12) below. The distributions of the **A, B, C, D** quadrants scores are relatively free from skew, so the(A) and (B) distributions generally show higher scores, and higher mean scores than the (C) and (D) distributions**.** In this very high category (see Figure 12) the A, B, C and D quadrants are zeroemployees. In contrast, in the lower classes (below a score of 50) the (A) and (B) distributions contain 5 employees for each style, whereas the (C) and (D) scales contain 5 and 9 employees respectively**.** To facilitate the answer to this question in this departmentby HBDI physiology, we drew the (16) profile brain to each one and grouped together showing in Figure (13).


**Figure 12: Strength of Employees Thinking Preferences in the Planning Department**

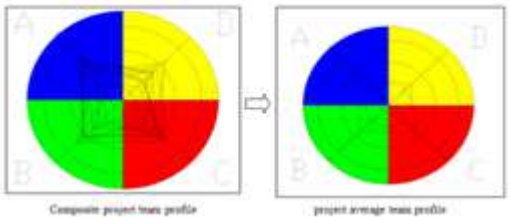


**Figure 13: HBDI Circle Explanation**

Preference map of the project team in the planning department show the all styles thinking **A, B, C, D** in intermediate preference (34-66) means in using status, and no quarter in strongly preference. We established a profile for the planning and reliability department of the company according to their objectives and their scope and success criteria, it is a monitoring and implementation department with a more reliability character has, many strategic planning to the company are out from this division. These qualities fall into the pattern of thinking (B) strongly preference degree, although showing an analyze and collaborative spirit and imaginative flair are not downplayed in the aims of this department and the requirements of its workforce.

**Figure 14: Alignment Gap of Project Profile and Average Profiles for Planning Employees in Company**

The above figure shows the planning and reliabilitydepartment of the company need monitoring action required in style thinking of (B) and (D) to increase them, and corrective action required in style of thinking (C) to reduce them, and no action required in (A) thinking style.

**The Maintenance Department:** The HBDI survey was administered to (22) employees in the maintenance department of the company following the instructions in the published manual. The values of the Mean, Standard Deviation and Median were calculated for all types of styles thinking, the following table shows the results:

**Table 8: Summary Statistics of the A-B-C-D Distributions for Employees Maintenance Department**

| | A | B | C | D |
|---|---|---|---|---|
| **Mean** | **55.72** | **56.95** | **46.59** | **52.54** |
| **Standard deviation** | **25.58** | **18.87** | **22.17** | **17.23** |
| **median** | **65.5** | **56.5** | **47.5** | **54.5** |

Table (7) shows that the style of thinking (B) is prevalent among the staff of the maintenance department, ranked at mean of (56.95) and a standard deviation (18.87), followed the style of thinking (A) with mean of (55.72) and a standard deviation (25.58), then style thinking (D) with mean (52.54) and standard deviation (17.23), and finally the style of thinking (C) with mean (46.59) and standard deviation (22.17). The resulting data profiles under the four quadrants making up the HBDI profile are shown in Figure ( 15) below**.** The distributions of the **A, B, C, D** quadrants scores are relatively free from skew, so the (A) and (B) distributions generally show higher scores, and higher mean scores than the (C) and (D) distributions**.** In this very high category ( see Figure 15) the A, B, C and D quadrants are zeroemployees. In contrast, in the lower classes (below a score of 50) the (A) and (B) distributions contain 8 and 7 employees respectively, whereas the (C and (D) scales contain 12 and 8 employees respectively**.** To facilitate the answer to this question in this department by HBDI physiology, we drew the (22) profile brain to each one and grouped together showing in figure (16).


**Figure 15: Strength of Employees Thinking Preferences in the Maintenance Department**

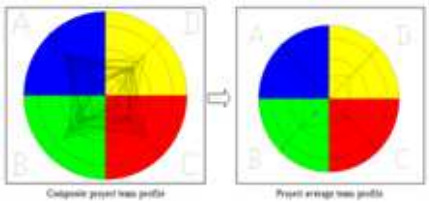


**Figure 16: HBDI Circle Explanation**

The preference map of the project team in maintenance department shows all styles thinking **A, B, C, D** in intermediate preference (34-66) means in using status, and no quarter in strongly preference. We established a profile for the maintenance department of the company according to their objectives and their scope and success criteria, it is worth mentioning that this section follows the planning department, many technical functions with implement characterare out from this division. These qualities fall into the pattern of thinking (B) strongly preference degree, although showing an analyze andcollaborative spirit and imaginative flair are not downplayed in the aims of this departmentand the requirements of its workforce.

Figure (17) shows the maintenance department of the company need monitoring action required in style thinking of (A) and (B) to increase them, and monitoring action required in style of thinking (C) to reduce them, and no action required in (D) thinking style.

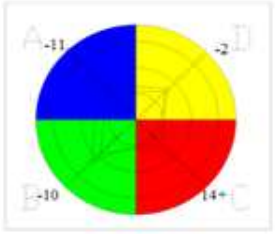



**Figure 17: Alignment Gap of Project Profile and Average Profiles for Maintenance Employees in Company**

## Discussing the Results of the Dominant Thinking Style of the Staff of the Arab Potash Company

The results of the statistical methods(mean, standard deviation, median) were revealed that the dominance thinking style among the employees at the whole level of the company is (A), this is normal because the company is of a productive industrial nature and is related to problem-solving, design, development, and operations, all of which are characterized by type (A), average mode A was a using quarter grade and did not have a strong preference rating using quarter, that's because (22.5%) avoid using this pattern and (57.6%) prefer to use this style strongly, and (19.9%) use it naturally. Also type (B) as it followed style (A) in dominance, as well as his order did not reach the degree of strong preference for use by employees, where the style (B) has characteristics worthy of the type of this company because it contains many projects are planned, organized, monitored and implemented. Where's (20.7%) avoid using this pattern and (36%) prefer to use this style strongly, and (43.3%) use it naturally. At the level of the departments, the dominant style of the projects department staff was the (A) followed by (B) but both of them in using quarter grade and did not have a strong preference grade, because the department requires this force to prefer these styles, it is a purely engineering department in which many of the construction and industrial projects that it assesses at the company level,it is a department dealing with numbers and logic in the analysis of data and that studies, monitors and implements the company's projects. To (A) where's (21.9%) avoid using this pattern and (57.5%) prefer to use this style strongly, and (20.4%) use it naturally, to (B) where's

(23.2%) avoid using this pattern and (34.2%) prefer to use this style strongly, and (11%) use it naturally. The dominant style of the planning and reliability department staff was the (A) followed by (B) but both of them in using quarter grade and did not have a strong preference grade. It should be said that this department is fully consistent with the descriptions of implementation, control, and planning of type (B) so it must be higher than this degree and higher than the style (A) himself, too (A) where's (12.5%) avoid using this pattern and (68.7%) prefer to use this style strongly, and (18.7%) use it naturally, to (B) where's (18.8%) avoid using this pattern and (50%) prefer to use this style strongly, and (31.2%) use it naturally. For maintenance department the style (B) was dominant among his staff, which is very logical because it belongs to the planning and reliability department administratively, but in using quarter grade and did not have a strong preference grade, to (A) where's (31.8%) avoid using this pattern and (50%) prefer to use this style strongly, and (18.2%) use it naturally to (B) where's (13.6%) avoid using this pattern and (31.8%) prefer to use this style strongly, and (54.6%) use it naturally.

**Results Related to the Question:- Are the Profiles of Arab Potash Company Employees Rare or Common?**

To answer this type of question we have two ways to describe the image oftheir profiles, firstly "what is the percentages of employees profiles that have single double, triple or quadruple dominance", a second "is there a match between the profile style of employee and model profile of his job". Figure (18) shows the percentage of profiles that have single, double, triple or quadruple dominance to the employees of this company. The chart shows the prevalence of single dominance, where it reached (62.2%) of the entire sample of the study, followed by doubledominanceaccounted (32.4%), finally the triple dominance about (5.4%), we note there is no quadruple dominance in their profiles. For more details about what the type of single dominance are common and what the order of them, same thing about the double and quadruple dominance, the following tables (8) and (9) based on frequencies and percentages

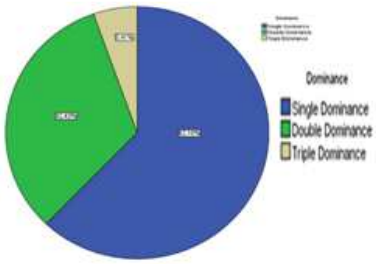



**Figure 18: The Prevalence of Brain Dominance among Company**

**Table 9: Distribution of Dominance Ratios and its Types of Company**

| | Degree of Dominance | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Single | | | | Double | | | | | | Triple | | |
| Dominant Style | A | B | C | D | AB | AC | AD | BC | BD | CD | ABC | ABD | |
| Frequency | 32 | 13 | 13 | 11 | 14 | 3 | 9 | 5 | 2 | 3 | 5 | 1 | |
| Percent% | 28.8% | 11.7% | 11.7 % | 9.9 % | 12.6 % | 2.7 % | 8.1 % | 4.5 % | 1.8 % | 2.7 % | 4.5 % | 0.9 % | |
| Total | 69 | | | | 36 | | | | | | 6 | | 111 |
| Total % | 62.2% | | | | 32.4% | | | | | | 5.4% | | 100 % |

**Table 9: Typical & Others Styles of Profiles**

| Top Level Managers | | | | Others | | |
|---|---|---|---|---|---|---|
| Single in (D) | Double in (AD) | Triple in (ABC) | Quadruple in (ABCD) | Single in (A) | Single in (C ) | Double in (BC) |
| 2 | 4 | 2 | - | 1 | 1 | 2 |
| **Middle Level Managers** | | | | **Others** | | |
| Single in (A) | Double in (AB) | Triple in (ABC) | | Single in (B) | Single in (C ) | Single in (D) | Double in (CD) |
| 5 | 4 | 2 | | 1 | 2 | 3 | 1 |
| **Engineers** | | | | **Others** | | | | |
| Single in (A) | Double in (AB) | Triple in (ABC) | | Single in (B) | Single in (C ) | Single in (D) | Double in (CD) | Triple in (ABD) |
| 15 | 10 | 1 | | 2 | 3 | 2 | 2 | 1 |
| **Technicians** | | | | **Others** | | | | |
| Single in (A) | Double in (AD) | Double in (AC) | | Single in (B) | Single in (C ) | Single in (D) | Double in(BC) | Double in(BD) |
| 9 | 5 | 3 | | 2 | 2 | 2 | 2 | 2 |
| **Foremen** | | | | **Others** | | |
| Single in (B) | | | | Single in (A) | Single in (C ) | Single in (D) |
| 6 | | | | 2 | 4 | 1 |
| **Secretaries** | | | | **Others** | | |
| Single in (B) | Double in (BC) | | | Single in (C ) | Single in (D) | |
| 2 | 1 | | | 1 | 1 | |

As a result, the percentage of employees who matched their profile style with the model profile of his jobon the whole company was (63.9%) about (71) employees, on all types of jobs. And the percentage of employees whose brains did not match their job was (36%) accounted about (40) employees as shown in table-10

**Table 10: Distribution of Employees Whose Brains did Not Match their Job**

| | Types of job | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Top level Managers** | **Middle level Managers** | **Engineers** | **Technicians** | **Foremen** | **Secretaries** | **Total** |
| **Frequency** | **4** | **7** | **10** | **10** | **7** | **2** | **40** |
| **Percent%** | **10%** | **17.5%** | **25%** | **25%** | **17.5%** | **5%** | **36%** |

## Discussing The Related Findings In Question: Are the Profiles of Arab Potash Company Employees Rare or Common ?

Data collection results are revealed from frequencies and percentages, that single dominance reached higher percent in this company employees (62.2%), and double dominance accounted about (32.4%) and triple dominance (5.4%) from all employees and (0%) quadruple preference. Comparison of the results of the research sample that we have with the Adams study (2003, which aims to determine the prevalence of dominance between individuals and found that (7%) have a single preference, (60%) have a double preference, (30%) have a triple preference, (3%) have a quadruple preference. We note from the results that single dominance is predominant among employees and this means that "if it is not from the same quarter as my favorite, it could cause problems", because this type is seen only in his view, here the percentage of (A single dominance) was higher, then (B), (C) in same level finally (D). Can be seen that there is a good proportion of double dominance, and here we hope to be a pair of styles complementary to some, and not contradictory such as (AC), (B-D), so (AB) is higher percent, they complement the left side of the brain. It is unfortunate that we only get the (5.4%) in triple preference and are close to a quadrant of preference only except one quarter. Here we favor this type because it has a

breadth of thinking in three quarters and has the ability to reach a language linked between the three quarters.

## CONCLUSIONS

From this work the following main conclusions can be drawn:-

- Styles of thinking according to Herrmann's perspective were fully operational in the Arab Potash Company, but in different proportions due to the different occupations of the employees and their department.
- The appearance of prevalence and medium activation in thepotash company to work according to the thinking style (A), because of their thinking in an analytical way in solving outstanding problems.
- The powerthinking of the maintenance department according to the thinking style (B), for their commitment to routine procedures, and "step by step" way to solve things.
- The power of the thinking style (C) of the planning and reliability department staff, compared to the remaining departments, and it is the intellectual style expressing emotion and tolerance.
- The weakness of the thinking style (D) of the staff of the Potash Company, is the intellectual mode of expression of creativity and holistic, synthesizing.

## RECOMMENDATIONS:

Based on the results of the study, the researchers recommend the following :

- Motivate the staff of the Potash Company to learn about the styles of thinking and give them attention about this subject because it is important to know their strengths and weaknesses points. By training courses remind employees to build decisions based on logical analysis and away from emotions, and before that urge them to search for facts and give the numbers and data importance in their functional.
- Encourage themanagers categories touse in more power the thinking style (A), to resolve outstanding problems and make decisions that are in favor of the company through analysis in more.
- 3.Need to distribute the potash company staff based on the results of the Herrmann scale (i.e.those who do not belong to their job styles) in other words "Functional rotation" to cover the gap and increase the company productivity and to reduce internal conflicts among staff.
- The inclusion of Herrmann's theory within the curricula of the students, in order to expand their abilities and understand their styles and give them strong indicators of the specifications of their field of work in the future
- Adopt the Herrmann scale as a recruitment tool and the establishment of teams work's from principle,"the right man in the right place", and work on renewing the HBDI database of employees for each period.
- Conduct further studies on the subject of thinking styles on other industrial companies and compare them with each other, the researcher could not do this procedure because of shortage the time of preparation of the thesis.

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