Wyższa Szkoła Bankowa
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Method of Assessing the Technical and Economic Levels of Development within the Model of Protection against Failure (MPF)
Case study: Decision Making in Libyan Oil Sector
2014_2019
(PhD Dissertation)

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Content

List of abbreviations used

C1   - Oil Well

C2   - Oil pipe transportation

C3   - Refinery

C4   - NOC National Oil Corporation

DIV 1 - construction department
DIV 2 - technology department
DIV 3 - department of the organization
DIV 4 - marketing department
DIV 5 - finance department
DIV 6 - information section

EA   - object development indicator
ED   - department development indicator
EF   - company development indicator

EL   - Executive Level (level of sales)

FAM   - Fail Assessment Method

MBF   - Management By Fail

MBE   - Management By Exception

DSD   - Detection System of Development

COC   - Crude Oil Companies

HL   - High Level

MD_T - Medium level for technical affairs

MD_E - Medium Level for Economic affairs

M1   - Managerial Product

M2   - Material

M3   - Machines

M4   - Man

M5   - Market

M6   - Money

M7   - Managerial Information

Preface

The Arab countries have great natural resources. Their population exceeds that of many European countries. Cultural centers have been developing in Arab countries for centuries as a result gaining a lead over many of the world's leading university centers. Here the Al Azhar University in Cairo is worth being mentioned as an example, it was established in 972, while the oldest university in Europe, namely the Sorbonne in Paris, was established in 1200, the Jagiellonian University in Krakow was founded in 1364.

In general, the issue analyzed in the dissertation is not only a problem in Libya as it occurs in most developing countries. The subject investigated here is the state's dominance in shaping the country's development strategy, in the absence of progress in the application of contemporary, dynamic methods of diagnosing and assessing the level of the implementation of tasks planned in the microeconomic macro scale. It follows that the colonial system stopped the economic development of these countries for a long time. Colonialists in the interest of their own capital were developing investments in infrastructure (roads, railways, etc.) in order to facilitate the penetration of a given country (Abdulgadier 1995).

The **inspiration** for the research problem contained in this work comes down to the search for the most simple and effective methods of supporting decisions in the selection of the technical and economic levels of development in Libyan enterprises enables to obtain different indicators of development levels by assessing the state of the current level with the possibility of choosing different variants, i.e. the possibility of choosing different ways of implementing production tasks (productivity and work) based on the preferences of the consumers and to be controlled in the current conditions of the free market economy in Libya (Khlafalla 1994, Hashem Saad 2019, Hashem Fathelrahman 2019, Hashem Saad, Hamza 2021, Rutkowska, Hashem 2021). However, the fundamental problem of this work is the assessment of the functioning of Libyan enterprises in the present day, since 8 years where companies operate based on modern technologies and applications of modern concepts to assess the operation with profitability. Also it is better to add that since the fall of Gaddafi - the Libyan economy has been going through a period of market transformation, in which the role of the state in shaping the development strategy of enterprises has decreased. The current radical changes in management styles require a radical change in organizational culture and management systems. Of course, on one condition: the decision-maker should be the director. He should have the power to manage according to his own assessment without consulting politicians, revolutionaries or trade unions. It turns out that this progress requires strictly defining new concepts and terminology, as in this work like the concept of " Development Level" (Rutkowska M., Tutja J. Hashem S. , Łasecki M. 2021/22 in printing).

The term "level of development" is a non-mathematical concept. Regardless of whether this concept is defined as a concept in the field of economics, sociology, law, or all sciences at the same time, the concept of the degree of "level of development" belongs to the disciplines characterized by the inductive method.

At this stage a logical question at this point arises is a reasonable of application the assessment and management systems themselves are able to bring economic effects without support in the form of system changes?

In this work, I undertake to analyze a significant problem of great scientific and application importance. The scientific value of work is an attempt to construct a method of assessing the effectiveness of the company's functioning that could raise the level of Technical and Economic levels in the petrochemical industry companies in Libya (Omar M. 2004, Hashem, Fatelrahman 2018, HashemS., Hamza M., 2021). The application value towards the practical implication of this work is essentially important. The author's ambition, it seems, is to design such an evaluation method that could significantly contribute to the improvement of the Managerial and Operational Functions within the concept of Protection against Failures to assess the current "level of development" in Time Now to increase the competitiveness to achieve the settled goals. It is important to add here, that Management Protection against Failure is treated as a coupling tool (Omar M., 2004) to support the process of decision in TN for organization function with controlling. This is important because the studied industry was managed by the end of the 90s of the last century in a prescriptive way, without the use of market competition mechanisms. The question here is whether the assessment and management systems themselves are able to bring economic effects without some support in the form of systemic changes? And at this point, I would like to emphasize that this is not a one-time evaluation, but a systemic evaluation.

In the first decade of the 21st century, in the period of the last 5 years, the process of limiting state intervention in business operations was liberalized and Libya is currently experiencing an era of a free market economy, while retaining certain regulatory mechanisms aimed at protecting society.

Also in one respect in the Arab countries there is much to do to overcome delays in the assessment of the company's operations and the level of development of organizational stability (Noga M. 2007).

In the assessment of the Development Level of companies, indicators of the degree of development levels were obtained on the basis of the COC and DSD systems (the systems are presented in the Attachment pp 135), in order to rank which of the companies are allotting according to the degree of production – that is the technical sphere, as well as their classification in groups depending on the indicators of the similarity of the economical actions – that is the economic sphere.

The first phase of assessing, as an (ex. Post), the decision maker evaluates in real time "TN" the effects of organizational progress on the basis of the achieved level of production and work from the past period (ex. Post) as an organizational progress in TN.

On the other hand, for the continual period of assessing the activities of the companies as a period of (ex ante), the decision-maker should deducts the effect of the company's operation in the prism of organizational progress and prior to the implementation of the

project based on controlling (Nowak M 2013) for the assessment the economic effects and decision making in TN.

In general, the issue of the financial condition of enterprises in highly and middle-developed countries is less complex than in countries with very low national income and very high inflation. Therefore, before examining the factors affecting the financial conditions of enterprises in Libya, it is necessary to outline the characteristics of these enterprises, the legal aspects that have a direct impact on their activities, the condition of the economy and infrastructure, geographic location in Libya and other factors. This presentation aims to make the decisions makers aware of the More than 50% of companies in the world go out of business because of a lack of cash, not because they are not making a profit. Especially in poor countries where there is a high risk of lending. In order to start any activity, an enterprise must first of all obtain funds. Therefore, in the further it is of useful to analyze carefully the flow of funds, their origin and size, as well as the rules for collecting cash. An important element in general, is selecting the company by industry. It is important to answer the question: what type of enterprise was decided on before the cash was accumulated?

The conditions dealing with in this research.

The ORGANIZATIONAL issues as prior to OPERATIONAL CONTROL are so extensive and are subject to such continuous and multidirectional changes that it is impossible to mention all current problems and trends. It is therefore necessary to limit the area of interest. Therefore, the beginning of the problem of "ORGANIZATION STAGES" and "CONTROLLING STAGES" (Pilawski B., Omar.56 Nowak 49) as a further step of the PHD research must be combined as exe ante investigation in Time Now (see chapter 1,3 and 4 –the genesis of the dissertation and further study for three chosen companies in the field of finance).

The field of interest of this doctoral dissertation has been limited to the framework of one industrial sector, and within this industry to one company and to one method of assessing the Level of Development of the dynamics actions (Economic level) and activities of production (Technical Level) in Final Product in National Oil Company in Libya using the knowledge of the disciplines dealing with both management and economic in the enterprise (Noga M. 1994, Radosiński E., 2013). And these two issues –Economical & Technical levels-constitute the subject of this doctoral dissertation on the oil industry sector in Libya.

The issue of measuring and assessing the Level of Development was made on the basis of the Simultaneous Procedure of S within the Model of Protection against Failure (MPF), while managing the stages of the development level of the final product in order to protect against falling at a given moment using the Concept of Management By Fail "MBF" basing on Management By Exception (Pilawski B., Omar 1992).

In fact the abbreviation MBF can be summarized as "Manage by-Fail" to assess the state of disturbance of an individual functioning in reality within the assessing by the Model of Protection against Failure (MPF).

The clarification of the "Manage by-Fail" can be summarized as follow:

1. **Fail** as a passive verb refers to stop working properly, for example the production was failed, because the activities of producing the final product is no longer profitable and the company needs to be manged differently,

2. Manage refers as active verb, to start making decisions by the manager to avoid or to cancel the fail in the activities or actions to satisfy the demand of the market,

3. by-fail – usually after the Fail, and from here the author of this work assumes that to make decisions in a business or an organization to be done by an efficient manager to avoid the Failure!

Hence from one side, the question arises what actually how "ORGANIZATION STAGES" should be understood, and from the other side in this research the term "CONTROLLING STAGES" deals with checking the results of the work and the production in a company in terms of benefits for the company itself (zone in) and the satisfaction of its external environment (zone out).

In final, the tasks of the MBF-MPF-MBC, first of all to detect the reasons of the Failures than the effects.

However, the fundamental problem of the work is the assessment of the functioning of Libyan enterprises in the present day, where there are many indications that the economic policy of the state and the current socio-political climate limit the influence and intervention in the activities of Libyan companies. Of course, on one condition: the decision-maker should be the director. He should have the power to manage according to his own assessment without consulting politicians, revolutionaries or trade unions. Hence, the proposed method of assessing the Technical and economic levels with MPF basing on concept of (Management By Fail - MBF) and Management By Controlling MBC are a tools to operate with profitability for detecting the deteriorating state of development of the form (equilibrium), which is to facilitate decision-making by the director.

This dissertation is devoted to management through failure studies - Management By Failures [MBF] and to be supported by Management By Controlling [MBC}. The aim of the PHD problem is to present the concept of a new style of management in business, i.e. management through negative deviation research - MBF, which focuses on the cases of deviations in the organization, management and evaluation of the functionality of companies belonging to the National Oil Concern of Libya in 2014-2019.

Inspiration for the above defined research problem investigated in this work is seeking maximum simple and effective methods of research support and detection which dominate the process of assessing the development of the oil sector development strategy conditioned by various dependencies, phenomena, events and states, in order to make and choose decisions regarding the adjustment of economic opportunities to the internal and external situation of Libya.

Based on the formulated work and hypotheses formulated here, the following thesis can be put forward:

"It is theoretically correct and practically useful to develop a method of measuring, assessing and managing the Technical and Economic levels into petrochemical enterprises in the field of productivity and performances basing on a chosen criteria allowing to accept the Technical and Economic levels in which the decision maker choses the highest <u>grades</u> and <u>indicators</u> for both the products and performance of work, in the current time to achieve a sustainable Technical and Economic level of the <u>*Developing Product*</u> basing on the plan of productivity, performance and export tasks in a chose period as a new conception of innovation to avoid the Failure (***<u>ex post ,time now ,ex ante</u>***)".

The defense of the thesis formulated above was made *<u>in four chapters</u>*, within *<u>three parts</u>*:

The first part (I theoretical Part) as the basic research provides the reader with general knowledge about the importance of oil production as the main source of income for Libya, and to propose to the authorities of managing this company, a modern system to assess and manage the Development Level of oil companies.

The second part (II Application Part) presents the rules of conduct in the method of evaluation the deviations in solving problems of protection against deviations with the use of the MPF concept as a basis for making managerial decisions using the MBF and MBC concepts, and especially in the conditions of changes in the functioning of companies in the sphere of organizing production and work, as well as in the phase of controlling the obtained results as illustrated in the following figure:
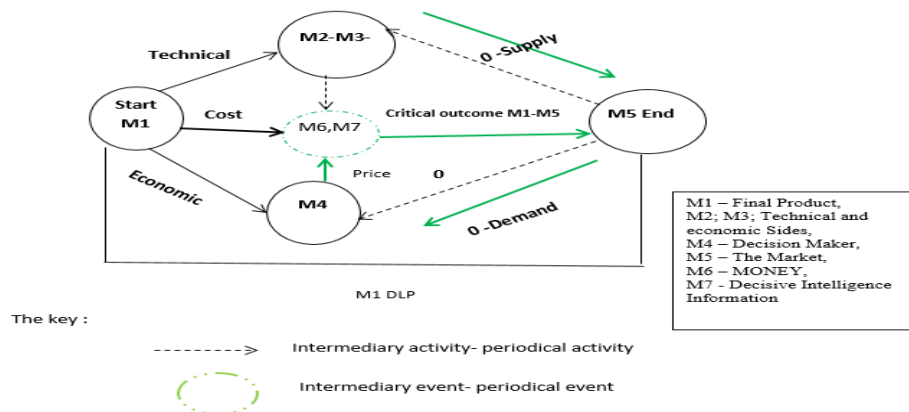
Fig.1. Development Level with MPF (Petroleum Market Economy in network terms)

Where the Price of DP is fixed according to both Cost & Demand

Illustration of the Technical & Economic levels of Development with MPF

(Hashem S., Fathelrahman A. 2019)

1. Start M1 with activities of production (technical) and actions of performance (economic),

2. End of M1 as Critical Path of M1-M7 to satisfy the supply & demand of the market

3. M2-M3 presents an event of the production activities, while M4 presents an event of performance actions,

4. M1-M7 the critical Path of the outcome (demand of the market.

At this point, it is important to emphasize that the dissertation aims to determine that "M1 is assumed as **P**roduct of **D**evelopment **L**evel" with Capital Letter to emphasize that is the most important level of development with a particular activities of productivity and the performance actions. In such a situation the Technical and Economic levels constitute the **D**evelopment **L**evel of an individual. (see Fig. 2 and chapter 3 the Technical and Economic Levels of the M1).
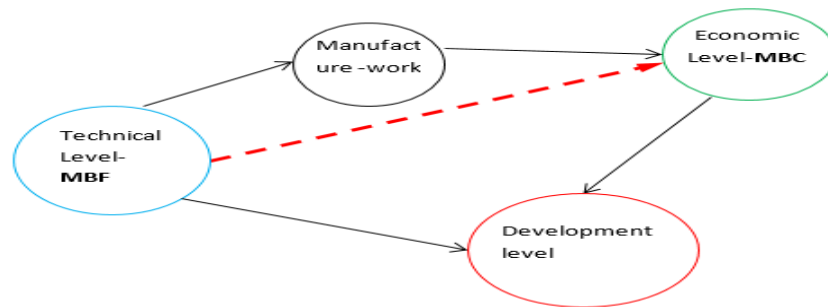
Fig.2. Network of IT in Assessing the Technical and Economic Levels

Source: Own study basing on (Hashem S., Fathelrahman A. 2019)

The construction of the research (fig.3) corresponds to the subsequent stages of the research process undertaken and consists of three parts:
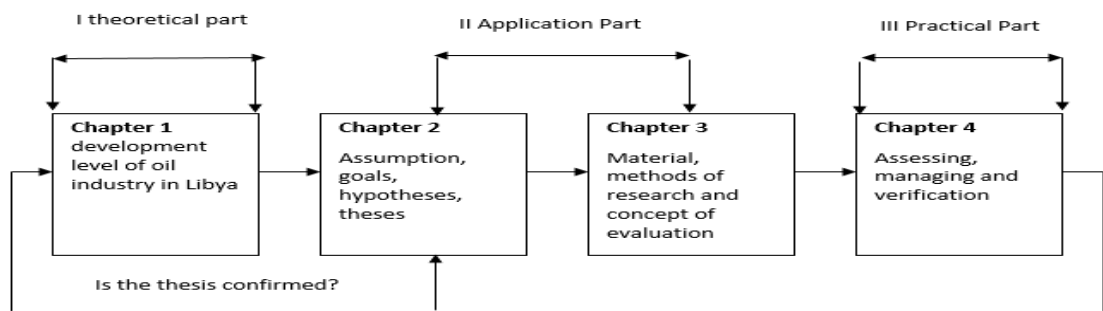
Fig.3. the research structure

I. THEORETICAL PART☐ : CHAPTER 1

☐ Presents the principles of assessing the Technical and Economic levels

of development in the NOC basing on managing the Failure on which the problem

of this study is based.

II. APPLICATION PART☐ ☐ : CHAPTER 2 & CHAPTER 3

☐☐ That is the proposal algorithms of putting the theory of chapter 1 to be applied to

the practical use of next chapter 4.

III PRACTICAL PART-Implementation ☐☐☐ : CHAPTER 4

☐☐☐ the material in this chapter presents the discussion of application the effect of ORGANIZING & CONTROLLING and to be presented for the purpose of the results and conclusion concerning the level of development in the NOC.

IV PART- RESULTS & CONCLUSION ☐☐☐☐ 5 THE END

☐☐☐☐ The final judgement (results & opinions) of the solved problem of the PHD.

On the other side, the third part (III Practical Part) of this dissertation primarily refers to the application of the systems within MBF in practice, and taking in concern as a basic proposal for the continuation of the assessment of the development level of the company through the MBC concept for the operational assessing the situation of the company on the market.

And at this stage in TN, the question arises what is the usefulness of the second conception of MBC?

It is of a completely different nature, depends on whether the implementation of this inventive conception as (ex ante) and the continuation of the conception of MBF as (ex post) under the conditions for the future will give economic effects, i.e. as a synergy of the first conception (the project of MBF) and the second new concept (the project of MBC) in the new reality of the enterprise?

The theoretical part as the basic research (Chapter 1) provides the reader with general knowledge about the importance of oil production as the main source of income for Libya, and the development of the theory about the level of organizational development of oil companies.

Chapter 2 concerns the description of the research assumption, including the goals, hypothesis and the thesis. The aim of the research is to identify and diagnose the level of organizational development of oil companies in terms of using the technical and economic potential by means of a chosen measurement and assessment tool. Evaluation and verification is used to assess the changes in practice.

From here Chapter 1 also presents the impact of the level of development of the oil industry on shaping the Libyan economy. It also shows that investments and services in

some public sectors came from oil export earnings. In this chapter, from the point of view of the author, the market mechanism based on the competition does not optimize the allocation of public resources, and the interference of the state in economic processes is a necessity. Also, the prospect of developing oil companies in the conditions of consolidation should not include mining companies from the public interest perspective. In the author's opinion, it seems that it is not important who owns a property, it is important, however, who has the order.

"The assumptions and objectives of the dissertation" are specified in Chapter 2 of the theoretical part.

It was assumed that it is possible to develop a method for measuring and assessing the organizational level of oil companies in Libya and to construct a system for assessing organizational effectiveness, which would provide quick information for decision-makers about the level of organizational development.

Also the application part (Chapters 2 and 3) concerns the description of the research material. The material in Chapter 2 presents 4 oil companies in Libya and it is shown that, the Libyan economy is based mainly on the oil industry. The materials constitute the basis for the project of the new method proposal in chapter 3. The proposed method deals with the measurement and assessment of the company development level. The author proposed the application of new principles for measuring and assessing the level of organizational development of oil companies. The aim of the research is to identify and diagnose the level of organizational development of oil companies in terms of using the technical and economic potential by means of a chosen measurement and assessment tool. Evaluation and verification is used to assess the changes in practice.

Besides this, in Chapter three the author presents the introduction to the role of management and organization to improve the activities related to managing and accessing the actions of the mangers at different levels of company organization. Also some modern methods based on the multidimensional analysis of management and assessment of enterprise activity are presented. For this purpose, according to the author of the dissertation, the selected literature items (mainly deals with the level of development) are the most characteristic of the issues discussed. When choosing these items, the author emphasized these topics which form the basis for specifying the thesis of the doctoral dissertation.

The items selected in the literature deal with novel problems in the field of the dynamic approach to measuring and assessing the level of objects development. In the investigations and in the application part, the author presents the assumptions, genesis and essence of the proposed FAM- Fail Assessment Method which deals with managing the deviation and evaluation of objects, emphasizing the role and the contribution of the method in combining the various elements of Multidimensional Comparative Analysis (WAP) and the Multicriteria Analysis into one coherent method for solving specific research problems in this dissertation.

The extensive knowledge of this method, originally developed as a research tool in enterprise management science (for continuous monitoring of the company's operations to detect, explain and prevent its deterioration), enabled the creation of an algorithm and a computer program system for the application of this methods in the evaluation of the level of organizational development in a company to detect its functionality.

Besides this, Chapter 3 presents the basis of the proposed method of assessing the concept of supporting the organizational level in the oil companies. It also contains a discussion on the adaptation of the method proposed to solve the problems of measuring the organizational level in these companies. The author has thoroughly characterized the basics of the method of assessing the level of organizational development and the suitability of the system which detects and assesses the activities of oil companies and their classification from the point of view of a specific criterion based on the characteristics of classified companies. The proposed method is aimed at detecting the state of development in the analyzed period on the basis of indicators that are to signal the reasons for such low or high level in relation to the ex-post plans and the necessity for the decision maker's intervention.

 The III Practical Part (Implementation) including chapter 4 demonstrates the usefully of the constructed method in the dissertation under the name of the Management by Fail -MBF in the evaluation of the organizational development level and its practical verification. This chapter includes the concept of two systems for assessing the efficiency of a petrochemical enterprise in Libya, aiming to measure the dynamics of the company's development level depending on the chosen reference system, i.e. in the years 2014-2019 to satisfy the demand for the normative system of the company, where the foundation basis is the assessment of the level of implementation of the plan, and finally in the spatial layout, where the pattern of development is determined by the size achieved by oil companies at that time. There are also examples of measures in which various determinants (parameters) of oil production are assessed. Obtaining such a level of development degree would correspond, on the one hand, with the development of the company's functional level in a given period, and on the other hand to assess the profit for the state to meet social needs.

Currently, organizational units conducting scientific-research and development work in Libya should focus on conducting activities in the field of science and technology in industry. In practice, however, it its does not function in this way.

Different legal systems of individual countries delay consolidation processes on a global scale. The diversity of legal acts and regulations in the world leads to some unfavorable phenomena both in the market and in the political sphere.

The conclusion of licensing agreements by Libyan companies was made on an "ad hoc decision" basis. The possibilities of cooperation between domestic cooperators were not studied, which caused material tensions, investment delays and costly extensions of implementation cycles. During the period of restrictions, Libyan companies had and still have difficulties in obtaining the necessary elements and parts from foreign partners.

From the author's point of view, when concluding a license agreement, one must first learn practically everything, starting from the mode of purchasing a license and ending with preparing staff for new production.

To the best of the author's knowledge Polish petrochemical companies are trying to extract oil in Libya. These are: PKN Orlen, Nafta Polska, Polskie Górnictwo Naftowe i Gazownictwo (PGNiG), Lotos and Petrobaltic. Cooperation with Libya is also interesting for companies providing geological and geophysical services, for example Geophysics Krakow. The chemical industry, the arms industry and construction companies in Poland also have a chance to establish commercial contacts.

Therefore, the intention of the author of the doctoral thesis is to ensure that the design and instructional part of the systems - Management By Fail (MBF) and Crude Oil Companies (COC) in this dissertation (the attachment of the systems pp135) are included in the technological documentation provided by the Polish contractor to the Libyan recipient. Hence, the presented doctoral dissertation is written both in English (its main part) and in Arabic.

The bibliography includes literature in Arabic (translation of the PHD of Libyan students in Poland), English and Polish. In particular, the selection concerned those items in the literature that deal with novel issues in the field of dynamic approach to the problem of assessing the level of development of objects. This dissertation in the IV. PART (results & Conclusion – the end) contains information on the developed systems and the conclusions drawn on the basis of their experience. There are also system attachments and instructions for use, as well as the interpretation of results

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Data Primary Sources:

The mentioned here in this research bibliography is more than just "key-ring". In fact it presents a set of sources connected together in one "ring" to be used as a useful sources for different goals support and confirm the procedure of assessing (the economic level) to satisfy the market demand for a product from one side, and the (technical level) to supply a product from the other side, basing on past knowledge in the field of assessing the development level of objects.

The main purpose of researches presented as an individual source within the bibliography, in advance to choose the applied sample chosen from the population (for example control and experimental groups), to be divided an to be assessed basing on various algorithms (for example Steinhaus, Bellinger, Pilawski or Hellwig algoriths) to divide the population on the basis of dichotomy division, while the division in this research basing on the cluster groups [for more details see chapter 2]

The following table presents the action of allotting the chosen sources within the period of allotting basing on the availability of the research methodology. I believe that it would be worth explaining in detail the achievements of the doctoral dissertations mentioned in the bibliography, but I only suggest presenting them briefly in tabular form.

No	Year	Source No & type		Used Method				
		PHD	Prof.D.	Stenhaus	Bellinger	Hellwig	Pilawski	FAM
0				68	12	27	54,55,56	32
1	1970		29	●	●			
2	1988-1992		79	●	●			
			65	●	●			
3	1975		28	●	●			
4	1982	31			●		●	
5	1885	7			●		●	
The line of Buffer[1] Change								
	1995/96	1,51	●				●	●
6	1998	19, 64	●				●	●
PHD researches & Scientific Papers						Hellwig	Pilawski	FAM
7	1999-2016	2, 4, 6, 8, 9, 16, 20, 23, 24,25,26, 42, 56,61, 62, 70 72, 73				●	●	●

In actual the conception applied in this research is [Mange by-Fail], where (Mange) refers to make decisions in business or an organization "By" an efficient Manager to avoid the Failures.

Continue to work this concept is called MBF "Management By Fail".

The individual bibliography items in this work aims to present two spaces of knowledge to solve various problems using the same algorithm in measuring, assessing and managing the Failure of individuals in different areas of life in Time Now :

1. Specialization Space (economy, medicine, engineering, environment protection etc.).

2. Synergy Space (strength the effect ability of application one algorithm within general income of many applied procedures).

In general, the sources applied in this research is addressed to the reader as an acknowledgement to acquaint him with the researches and the investigations in the field of multidimensional an multi criterion analysis

Example 1 – Medical and Health Sciences application

	Area-Field Medical & health Science						Algorithm Procedure to assess the Failure						
	Chosen bibliography												
	79	29	5	2	24	42							
	Failure & Decisions –individual agreement (common goals)						Algorithm Procedure to assess the Failure- with Individuals Synergy (the same Algorithm)						
	1	1	1	1	1	1							
	Summation Points =												
	6						Synergy Effects						
79							1						
29								1					
5									1				
2										1			
24											1		
42												1	
	Summation Points "synergy effect"=												**6**

[1] The buffer line presents the boundary line between the present "cluster divisions and the past dichotomy division basing on MPF-MPF instead of MBE.

Example 2 – Nutrient & Quality application

	Quality of items						Algorithm Procedure to assess the Failure					
	Chosen bibliography											
→	62	72	-	-	-	-						
	Failure & Decisions –individual agreement (common goals)						Algorithm Procedure to assess the Failure-with Individuals Synergy (the same Algorithm)					
	1	1	-	-	-	-						
	Summation Points =											
	2						Synergy Effects					
62							1					
72								1	-			
-									-			
-										-		
-											-	
-												-
	Summation Points "synergy effect"=											**2**

Example 3 – Economy & Finance application

	Quality of items			Algorithm Procedure to assess the Failure		
	Chosen bibliography					
→	1	4	This PHD research "1_1"			
	Failure & Decisions –individual agreement (common goals)			Algorithm Procedure to assess the Failure-with Individuals Synergy (the same Algorithm)		
	1	1	1			
	Summation Points =					
	3			Synergy Effects		
1				1		
4					1	
"1_1"						1
	Summation Points "synergy effect"=					**3**

I. THEORETICAL PART

CHAPTER ONE
ASSESSING THE TECHNICAL AND ECONOMIC LEVELS OF
DEVELOPMENT IN TIME NOW

1. The philosophy of a comprehensive _level of development_- introductory issue

1.1. Development level concepts

The term "level of development" is a non-mathematical concept. Regardless of whether this concept is defined as a concept in the field of economics, sociology, law, or all sciences at the same time, this concept belongs to the disciplines characterized by the process of inducing by the factors which determine the of features which characterized the "level of development in TN. In this research both the decisive features and the conditional factors called Characterized Values – CV of the measurements taken in the research.

In addition, the problem that I am trying to solve in this work has been divided into:

1. specification of the selection of the Decisive Features determining the level of development within the "ORGANIZING STAGES" (56) of the productivity in a company, and the Conditional Factors determining the level of development of production and performance depending on the values of the Decisive Features and Conditional Factors (to be putted in the form of indicators describing the degree of the level of development and the indicators of the performance in the chosen time).

2. Assessing the current **_level of development_** – that is not possible without a tool of constant monitoring and implementation of the company's goal in a given situation within the "CONTROLLING STAGES" (49) to deal with checking the results of the work and the production in a company in terms of benefits for the company itself (zone in) and the satisfaction of its external environment (zone out) that is the operational of the company in the market.

On the basis of the formulated aim of this dissertation, the author also set a scientific-research task, covering the full research cycle from searching for an adequate, theoretical model of the problem and its solution to empirical verification of choosing a suitable IT tool.

The concept of **MBF**, i.e. **M**anagement **B**y **F**ail to measure and assess the deviations (not acceptable values). All this to be done within the principle **M**anagement **P**rotection against **F**ailure (**MPF**).

The essence of MBF is the identification of deviations, i.e. such values that deviate from the routine organizational behaviors in force in the enterprise based on the established

deviations resulting from the ineffective organizational and technical economic system in the enterprise.

MBF as an indicative method (logical reasoning) allows to obtain both the level of development of productivity and the level of development of performance in a company on the basis of the obtained degrees of productivity and the indicators of performance- by applying the decisive features and the conditional factors which determine the "level of development" in the company.

Difficulties in measuring, assessing and managing the productivity and the performance levels in Libyan oil companies has been solved based on the S model and the MBF algorithm, which provides objective support in the analysis and evaluation of statistical data to assess the level of development in these companies. The new principles and approaches used to measure and evaluate the relationship between oil extraction companies, pipeline transportation, oil distillation and a central oil exporting company are very complex and complicated than other companies in Libya. Hence, it was possible to group these companies according to their level of development on the basis of many data.

In this dissertation the author's accepts in working mode of the term "development" as a new stage or event, while "development level" presents the difference in score or position achieved in time or into spaces by both the *managing entity* and *objects of the production process.* For the first, it means the experience or skill of performance achieved over a period of time, while for the objects of production results denotes more or less developed items accepted by both "zone in and zone out ".

1.2. The Technical and Economic levels of Development

Currently, a modern company wanting to achieve and maintain a competitive position on the market must ensure an appropriate level of quality of the products it produces. However, quality - in addition to production efficiency and costs - is increasingly becoming a decisive element in the company's duration and development. Achieving the desirable quality of products requires the application of appropriate product design, selection of materials and raw materials and their proper control, within the qualifications of employees authorized to control all processes of manufacturing products inside the company, as well as related to their external distribution (market).

In combination of the problem of quality and the quality of the development level in companies, it raises some questions of nature, what is the quality and what is the organizational development's quality?

- is it possible to assess the quality of organizational development?
- Hence by which measures we need to an assessment?
- is there is any basic definition or classification of the organizational development according to establish any standards?

In general, the concept and definitions of the quality is contractual. These definitions differ significantly and are determined in various ways by the researchers of the quality issue.

In my opinion the quality of organizational development acts indirectly on the level of development of the company.

The Concept of measuring „quality of organizational development in the company" in the proposal method MBF is nothing other, than the "level or degree of development". The method of MBF aspires to use quantitative and qualitative interpretation instead of the qualities signs Q by the index of estimation the *level of development EA* for each company (see the proposal system).

In General, in this research the problem of Technical and Economic levels needs to define the ORGANIZATION STAGES for the purpose of quality in the company, and the CONTROLLING STAGES to check the motivation and innovation to keep in the market as follow:

Hence, the question arises what actually how ORGANIZATION should be understood.

There are five consecutive stages which are more or less developed depending on particular situations; however, they are all present even if only in a very limited form.

Stage 1 Is the starting point (organizing function with planning function) setting clearly defined goals?

Stage 2 Whether the availability of the resources in the current conditions are necessary to meet the set goals of the management?

Stage 3 Is the preparation of chosen those resources in TN conditions, satisfy the previous stage?

Stage 4 Is the implementation of the developed plan of actions is easy to apply in practice to avoid the "Fail"?

Stage 5 Is there is a "***Controlling Tool***" of the obtained results and drawing conclusions for the future?

Having accepted the above mentioned rules of organization for the needs of this dissertation, I would like to add that without and efficient information system, a contemporary organization is like an organism devoid of life. The organization life is characterized by dynamics (changeability) and, from the FAM perspective, also deviations in functioning from one state to another.

Thus, any traces of deviation require CHANGE and each CHANGE requires a DECISION.

The decision must be based on INFORMATION.

In the next phase of assessing the operational of the company with in both zone on and zone out, it is assumed by me basing on the 7M within FAM Method, that the purpose

of [CONTROLLING STAGES-" Mastering the functionality of a company"] in general, based on checking the results of the work and the production in a company to supply the market with its demand for the purpose of achieving success in pursuing company goals.

In general, controlling stages deals with checking the results of the productivity and performances in a company in terms of benefits for the company itself (NOC-zone in), and to satisfy the demand of the (Market- zone out).

There are three consecutive stages which are more or less developed depending on particular situations; however, they are all present the effects (outcome) of either good or bad management of the company (the Failure). In this study there are three actions which present the outcome of the company ;

1. the cost of the production and the performance,

2. the demand of the market,

3. the value for "Developing Product" in terms of hard currency on the basis of controlling the obtained results to draw conclusion for the future (motivation and innovation).

Hence, a modern organizer must be equipped with additional system with MBC as a modern warning and information system to fix the **deviation from normal company functioning.**

The decision in the management scene must be based on INFORMATION within The role of Organizational & Controlling Stages in managing the company within the management's platform as shown in Figure. 1.1.a & Figure 1.2.b.
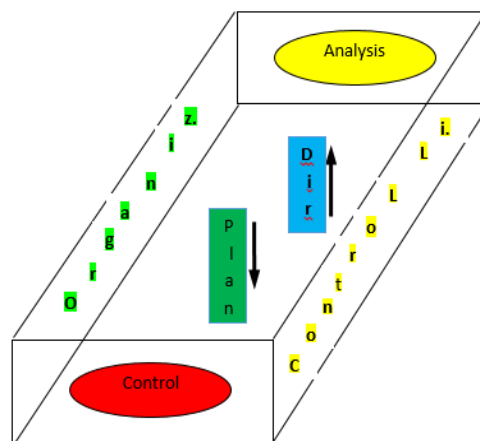
Fig 1.1.a. Impressionistic picture of "Management Building"

Presents illustrative of management Scene when and where important events and activities occur[2] (49,52,56)
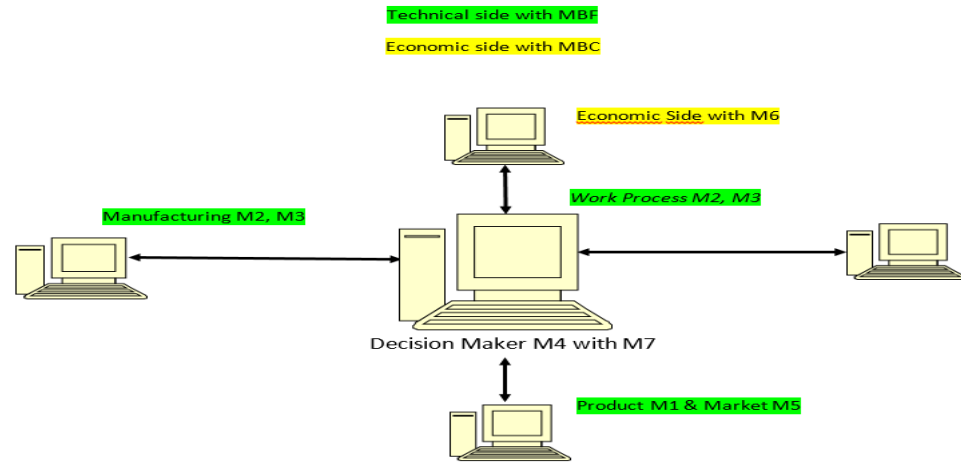
Fig.1.2.b. Management's Functions and Controlling (52)

The FAM Method assumes that **organizing function** as a part of the management's functions is a MASTER FUNCTION of an organized company when and where important events of management functions occur and present the development level of the company. In such a situation, the role of the ORGANIZATIONAL STAGES as a tool of assessing the level of development in a company, must cover five consecutive stages more or less developed depending on the decision maker's chosen.

Therefore **organizing** as a **key master** has an important influence on the level of development of the company to realize the setting goals (M1 to satisfy M5) in the plan, that is the implementation of the events and action, to put it to practice **(satisfaction of Zone in –Zone out M6,M1).**

1.3. Degree of development EA

By studying the principle of FAM method I found out a particular measurement for assessing the stability of _development level_ in a company. The new measurement denoted with the sign EA as <u>degree of the development</u>. The measurements of the development includes in its extent of assessing in time and space the <u>indicator of performance as a grade EA_s index</u> <u>of similarity EA</u> in the company to show the relative level of similarity development level compared with that of a previous date or in another company.

The idea of the 7 M in FAM

Within the **4** M [**M**an, **M**oney, **M**aterial, **M**achines], the FAM method considers additional 3 M {**M**anagerial Product, **M**anagerial Information, **M**arket] to make a decision. Then we can say, that the 3 More M already are located within the 4 M; so the

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[2] See the idea of impressionistic building of management according to FAM (52)

synergy between (M2 –Material) and (M3- Machines) gives the Product M1, while the M6 – the Money related always to synergy between the M1 – product (zone in) and the Market M5 (zone out) to satisfy the demand; then the decision maker M4 with the synergy of the information M7 and M6 in different fields allows him to check the stabilization of the production and the performance take various decisions.

M6 Money, M7 Information, Market (M5), (M2,M3,M4) Production with performance-(M1) Product as a result of motivation and innovation to satisfy the Market.

In general, the 7 M containing seven singles M with full capacity, of each with much and many possible Characteristics Values – CV (features, factors, amount, quantity, quality, extend, dependency on or cooperation with) to distinguish the difference between several objects or phenomena and to recognize their level of development in Time Now. It is possible to manage the level of development of a Developing Product – DP on the basis of many conceptions, among them the conception of 4P within the 7M of FAM.

According to FAM we say that the two same companies aren't quite level of development. The company no. one is in high ranking place above others in importance, level of production (manufacturing) or high level of quality and with greatest level of performance its work (that is its ability to operate efficiently. While the second company with poor level of performance in relation to the company no one, due to bad process of performing and not sufficient ability to operate efficiently.

From here the proposed system COC in this study, deals with a trial run[3] to measure and assess the level of development to enable the decision maker to manage the manufacturing process and the performing process in Time Now to avoid the failure.

Therefore the qualification classes for this purpose are a groups of four classes to allocate the objects according to their position of ranking, importance, quality, similarity, economic level or technology level. As mentioned before COC is a system that divides companies into such groups according to their abilities of producing and performing.

The Decision Maker with the 7 M

I. The decision maker must be awarded that, first, the economy makes choices depending on the conditions in a given situation.

II. The MBF & the MBC concepts contain the same tool to decisions in a business under a different names.

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[3] (the process of testing the level of producing and performing the products in order to manage the level of development companies in TN)

III. Both of the decision makers within the concept of MBF or MBC to take the decision he must take into consideration the situation in TN to choose a **rational[4] or the optimum[5] decision** in a given condition.

IV. in the case of the MBF concept the tool (system) enables the decision maker to take decisions within the functions of the management to manage his company in order to realze the setting goals in the plan.

V. While for a manager in a company using the tool (system) within the concept MBC, that is the economic viability (possibility) in terms of expenses that to take in consideration both the cost and the demand to satisfy (zone out –M5) and to protect the company (zone in M6) against the failure and to start the process of innovating.

In my dissertation I present a new Pragmatic Method under the name Management By Fail -MBF.

It is a pragmatic method which treats the Development Level of Organization in the Libyan company in a **realistic** way. This means concerning with actual circumstance with the company ability and actions to realize its goals to satisfy the need in both inside the company and outside environment. That is to be done rather than the problems according to known general **theories.**

The pragmatism approach means treating the development level of organization in a sensible and realistic way to produce good results and not to fail. Beside this the pragmatic method is dealing with practical flexible way to solve solution the problem of the quality management and the simulation by using the simultaneous which is contained in its formula, to treat that problems as happening and done at the same time to create certain realistic condition as a real ne in practical reality rather than any theories or standard in practice.

In general, the degree of development level is a useful measurement tool to provide the manager with specific information about the performance in the company basing on so called features of functionality, and on the other side on so called factors of efficiency about the level of development or state of development and to warn before the fail occurs. (See the formula of "S" in chapter 3).

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[4] A rational decision does not mean a radical decision, when our choice of the offer is based only on choosing only the cheapest one and not the most advantageous offer at a given moment and a given place. In politics, a liberal decision i.e. optimal decision speaks, and opponents say a frustrating one i.e. irrational, decision

[5] However, the optimal choice is when, for example, a company has the option to produce 100 pieces a day, but the market only needs 60 pieces a day, then the optimal decision takes place and you need to produce only 60 pieces.

Modification the symbol of <u>7M</u> into <u>4P</u> referring as current Practical usage

The purpose of the <u>7M</u> in **assessing the process of Development Levels has been** modified to suit the requirement of practical implementation of the reality tasks performed in order to realize the process for assessing Developing the Technical and Economic levels by application the **<u>4P</u>**.

Therefore, moving from theory to apply the <u>assessment against the Failure</u> in order to create a new strategy towards the individual's level of development. It should manifest itself in the implementation of addition of so called in FAM method 4**P** & four "**<u>D</u>**" to the "**<u>4M</u>**' to aggregate the "**<u>7M</u>**" of FAM

1.4. Comments on quality and organizational level of management

<u>The term "Quality" refers to:</u>

- Standards of something when compared to other things,
- The measurement of something by testing how much of it or how it is, how good or bad something, good of the highest quality or high standard or level, that is usually good characteristic or distinguishing feature.

We say quality control means practice of checking the quality of products by testing samples, and also we can say management of the quality of something that how it fulfil standards according for example to the ISO standard.

<u>Understand the meaning of "ORGANIZATION"</u> (see page 38)

In this dissertation a working assessment was made that organisation is the knowledge which should be possessed by a director, engineer, economist, lawyer, etc., so as the company they manage is profitable (money -M6) in terms of benefits for the company itself (zone in) and the satisfaction of its external environment (zone out).

It is not enough to know a company strategic plan, company structure or product manufacturing procedures (product-M1), state of accounts (M6), resource management methods (M2,M3,M4), market needs (M5) and information supply (M7) in the "zone in" and "zone out" areas. It is also necessary to know the <u>ORGANISATION RULES</u> for the purpose of achieving success in pursuing company goals.

Hence, the question arises what actually is understood as ORGANIZATION?

In my opinion there are five consecutive stages which are more or less developed depending on particular situations; however, they are all present even if only in a very limited form.

Stage 1 Is the starting point (organizing function with planning function) setting clearly defined goals?

Stage 2 Whether the availability of the resources in the current conditions are necessary to meet the set goals of the management?

Stage 3 Is the preparation of chosen those resources in TN conditions, satisfy the previous stage?

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Stage 5 Is there is a "***Controlling Tool***" of the obtained results and drawing conclusions for the future?

Having accepted the above mentioned rules of organisation for the needs of my dissertation, I would like to add that without and efficient information system, contemporary organisation is like an organism devoid of life. Organisation life is characterised by dynamics (changeability), and form the FAM perspective also deviating in functioning from one state to another.

Thus any traces of deviation require CHANGE and each CHANGE requires a DECISION.

The decision must be based on INFORMATION.

Therefore, it can be said that an efficient (capable) ORGANIZER who is supposed to lead their company to success should devote most of their time to the following activities:

1. Gaining knowledge on what is going on in the company and its environment (zone in, zone out).
2. Use personal experience and knowledge for the purpose of solving deviation problems by developing new action plans.
3. Introduce CHANGES, i.e. decisions related to an accepted plan.

Hence, a modern organiser must be equipped with a modern warning and information system related to even minor systems problems, i.e. deviation from normal company functioning.

1.5. Geo-strategic location of Libya

Libya is located in the African part of the Arab world, occupies a significant area of the continent, about 1.775.000 km2, which gives it the fourth place among the largest African countries after Sudan Algeria and Zaire. Libya is also fourth in terms of area among Arab states in Sudan, Algeria and Saudi Arabia. It lies on the central Mediterranean coast.

The Libyan coast is 1,900 km long and is the longest of the sea. To the east of Libya lie Egypt and Sudan, on the west side Libya borders on Tunisia and Algeria. Chad and Niger lie south of Libya. This location gave Libya a strategic importance in terms of international sea-and-air transport [Map 1]. Its coast connects the countries of Central Africa with southern Europe, the Arab countries of Magreb with the eastern part of the

Arab world. The distance between the coast of Libya and its southern border is about 2,000 km, which has always given Libya the role of a bridge between central Africa and the coasts of Europe.

Libya is the shortest land route between the two zones. Its long coast and proximity to the Mediterranean islands, such as Crete, Sicily and Malta, give Libya additional importance when it comes to shipping in the Mediterranean.

African goods exported to Europe, such as gold, natural herbs and copper, pass through Libya. On the other hand, ships loaded with goods destined for various countries of Central Africa are accepted.

This strategic location of Libya contributed to the fact that it became an object of interest for the colonizers [cf. Fig. 1.3. (map)].

With the discovery of oil in Libya, interest in this country has increased immensely. The United States has tried to make it a sphere of influence by linking Libyan policy with the American one. Oil corporations and military bases were to facilitate this task for the American government. In addition to the American presence in Libya, it was possible to note the traditional presence of British forces stationed in this country since 1943.
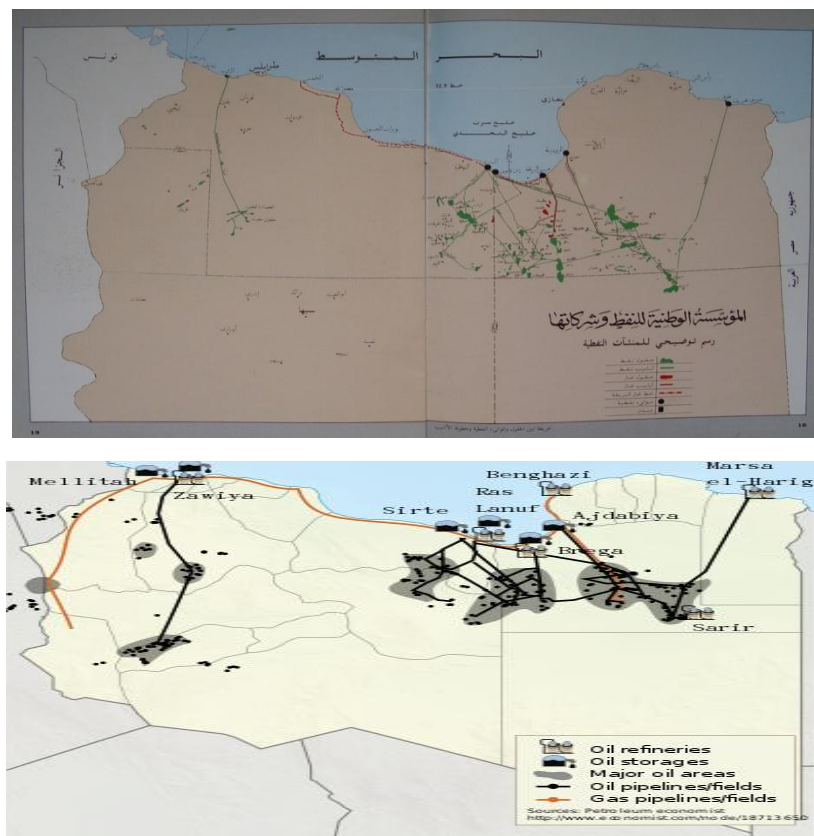

Fig 1.3. Petroleum companies [map]- (67)

French influences were also noticeable due to geographical proximity. France had great influence in Central Africa. Regarding the United Kingdom, we note that Libya was of strategic importance to her, as Burg and Tripoli were two important links on the route of

important towns in the southern Mediterranean that connected Britain with its bases on the Arabian Peninsula. In addition, the airports in Tubruk and Tripoli were transit points for airlines in their connections with East Africa. Middle East and the region of the Indian Ocean

From here you can understand the growing interest of large European countries in Libya, both in the past and now. They sought to have their forces near that country or in its territory. Even during the Second World War, Libya was taken away from the Axis countries and found itself in the hands of the Allies. After the end of hostilities, post-war order began to take shape.

At that time, in Libya, there was a British military base (Aladam base) in Tubruk. The United States has established a large base of "Huilas" near Tripoli. In this way, after the end of hostilities - the West had full control over the great area to which belonged: South Europe, North Africa and Turkey, which enabled closing of the gates of the Mediterranean Sea against the former USSR.

In addition, by having the longest coast on the Mediterranean, Libya has become a country that has the potential and own interest to influence the course of events in the Mediterranean. On the other hand, it is a cheap oil state in terms of oil exports and petrochemicals, because the Suez Canal is used.

The changes on the Libyan political scene that took place in September 1969 are among the most controversial, at least on the political Arab scene, because of the speed and efficiency of these changes. These changes have positively influenced the situation of Libya and the Arab World.

The first positive effect of the changes was the liquidation within just four months of one of the largest US military bases and other located in the area of Libya outside of the US, and the withdrawal of all foreign troops, including Italian ones from its area. One of the most surprising and controversial issues in the ongoing changes was the overthrow of the army's young officers, the ruling royal regime, which was supported by alien forces and the royal police, which numbered and equipped the country over the Libyan army. The news about the overthrow of the royal regime in Libya surprised the Western world, especially the American and British political circles. Speculation has begun on the political direction of the new authorities. Western circles from the United States immediately expressed their dissatisfaction by describing the changes taking place by a military coup. The Libyan people's support for the new government gradually increased, and restrictions such as the curfew were gradually lifted.

What happened in Libya on September 1, 1969 was more than just a military coup, in fact it was a national revolution that led to the change of royal power to power endorsed by the people. This change was the largest event in the entire political history of Libya. This event has become a turning point in the history of this country, which initiated political, economic, social and many more changes.

Following the course of political changes taking place in Libya, it can be noticed that they are the result of long-lasting and hard work and planning. Preparation for them

lasted for 10 years. The beginning, or rather the seed of future changes, was the idea that was created in the mind of Gaddafi in 1959. At that time, Kadafi was still a student. His idea was realized 10 years later, in 1969. This proves that the idea of transformation in Libya was planned, it was not a whim or a sudden and fleeting idea, which is why identifying the changes introduced as a military coup, the aim of which was to come to power is unfair and unfair. The introduction of force and military changes in Libya was necessary because the ruling royal regime was too strong and had too much support from external forces to be carried out through political peace and through dialogue. The Libyan National Army proved to be the only and extremely helpful force in overthrowing the royal regime. It can be stated that the steps to carry out changes in Libya were taken already in 1959, when the officers who contributed to the overthrow of the old authorities were still students. At that time, the first cell of the revolution was created. On September 1, 1969, the Organization of Free Officers, with the support of the Libyan army, overthrew the monarchy and proclaimed the Arab Republic of Libya. This event was a surprise not only for King Libya Adris, who at that time rested in Greece, but also for Western intelligence. The Council of Command of the Revolution took over all the power in Libya.

In this way the period of the political history of the royal monarchy ended, the history of the king, who was the political, economic and military satellite of the West from the day he took power with the support of the American and British authorities. The most important factors that contributed to the overthrow of the royal power in Libya include:

1. A high-level conspiracy that allowed for proper preparation of the plans and mechanisms of action necessary to carry out the revolution.
2. Determination of free officers who proclaimed the slogans of freedom or death, even if it would lead to an armed confrontation with the American and British forces.
3. Complete and full support of the revolution by all groups of the Libyan people, which created a protective cordon.
4. Speed of mastering the royal police mechanized its bases and centers, and thus paralyzing its activities.
5. The charisma of the leader of Muamar Kadafi, who had a very positive influence on the morale of the remaining members of the Central Committee of Free Officers and soldiers who carried out orders and took the risk of dying on September 1, 1969.

The political changes that took place on 1 September 1969 contributed to the economic development of Libya and made it a country for influence which both the West and the former Soviet camp sought. Currently, Libya's economic cooperation with many countries around the world is in line with the economic interests of all parties.

1.6. The importance of oil for development economic world

Crude oil is a natural hydrocarbon energy resource, formed from organic matter of dead organisms as a result of complex biochemical, chemical and geochemical reactions [39]. The main supplier of crude oil to global markets are Middle East countries. About 56.6

percent concentrate in this region from estimated at 1333,1 billion barrels of documented oil reserves (2007). Definitely less is found in Central and South America (14.9 percent) and Eurasia (not including the Middle East countries 10.3 percent.

The oil tycoon is Saudi Arabia, which has almost 1/5 of the world's oil resources. Less deposits are found in Venezuela (12.9 percent, world resources) and. Iran (10.3 percent). Among the Eurasian countries, Russia stands out (5.6%). In this light, the oil deposits in the most populous in Western Europe Norway are negligible, because only 0.5 percent, the percentage of documented global resources (in the case of Great Britain it is even less, because about 0.2 percent).

IbnGR study based on BP Statistical Review of Energy 2010, www.bp.com
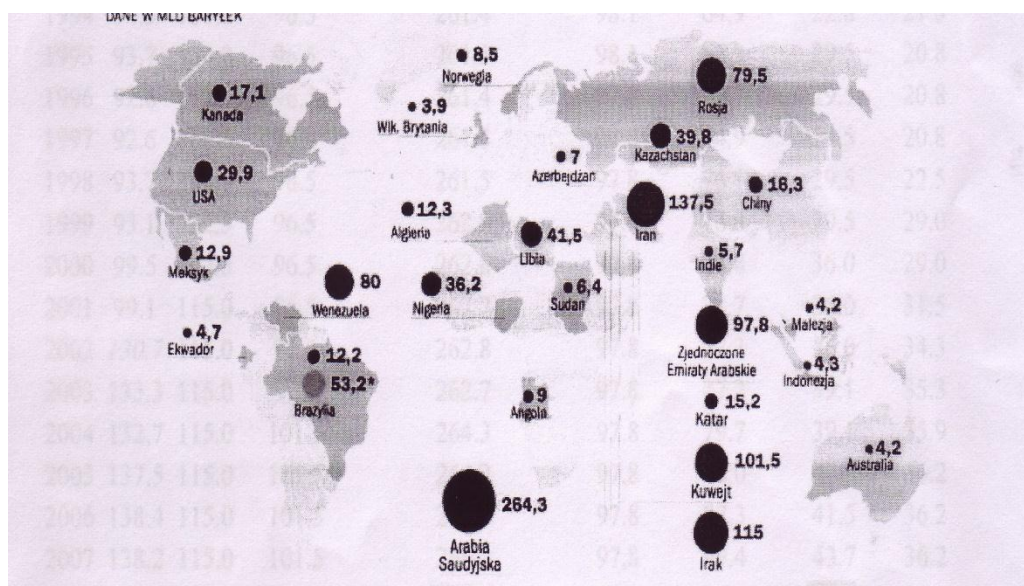
Fig 1.4. Documented oil reserves 2007.
Source: BP Statistical Review of World energy 2007

There are doubts about the credibility of the official data on oil resources in the world. The quota system for oil resources in the world was introduced in 1980, however, OPEC (Organization of the Petroleum Exporting Countries) - the Organization of Countries Exporting Crude Oil. It includes: Algeria, Angola, Saudi Arabia, Ecuador, Iraq, Iran, Qatar, Kuwait, and Libya. Nigeria, Venezuela and United Arab Emirates stipulate that these are estimates and are not subject to OPEC controls (Table 1.1.) [1]

Source: WORLD ENERGY OUTLOOK 2005:Middle East and North Africa Instehts. INTERNATIONAL ENERGY AGENCY. 2005 year. pp. 125-126.

http://www.iea.org/textbase/nppdf/free/2005/weo2005.pdf.

The global oil production in 2009 amounted to 84.86 million barrels per day, or about 4130 million tonnes per year. It was lower compared to 2008 by 74 million tonnes, when the total output reached 4204 million tonnes. Based on the data for the first three

months of 2010, it is estimated that global oil production will increase again and not significantly exceed the level from 2008.

Over 39% of production (1624 million tons) is attributable to the countries associated in the cartel.

The world is aware that there will be no energy alternative to oil and gas in the next few decades. Although the progress in looking for alternative sources depends on the reduction of resources of these raw materials, however, the progress in these studies is very slow. Meanwhile, with the decrease of resources, their price increases.

"An example is shale gas. The profitability of shale gas extraction depends on the existence of a natural network of cracks and hydraulic stimulation treatments. Due to the significant diversity of reservoir conditions - even within the same deposit - profitability can vary significantly. In 2009, Credit Suisse estimated the profitability threshold for shale gas extraction at a price of $ 0.12. - $ 0.37 per m six, at an average of $ 0.28 for six months. In order to encourage the take-up of unconventional gas in the United States in 1980, tax exemptions for nonconventional Fuels Tax Credit were in force until 2002. ",

Crude oil, due to its key importance for the global economy, evokes the greatest emotions in the political and economic sense. Disturbances in the supply of this raw material may trigger an economic, financial and political crisis. Therefore, many times energy resources have been the cause of armed intervention in such regions as the Middle East or the Caspian Sea region.

In 1973, the nominal price of oil did not exceed USD 3 per barrel. In October 1973, the Israeli-Arab war broke out, which was primarily a war for land, but it soon turned out that it also became a war for oil, or at least an ignition of the largest oil crisis in world history. Restrictions in oil supplies were the target of the impact on the economy of oil dependent highly industrialized countries, to a large extent paralyzing their economic and social life.

Under the influence of this oil crisis in the USA and France, the implementation of nuclear energy development programs was accelerated. Also in many countries, as a result of pro-efficiency measures, a number of energy-saving technologies have been implemented in industry, construction and other branches of the economy.

The first half of 2008 was a bad year for the global economy, and undoubtedly the beginning of a new oil crisis, where the price per barrel exceeded 140 US. There is no doubt that the reason for the increase in prices is not only due to the declining supply of this raw material, but also due to the weakening of the dollar, the increase in demand for China and India for this raw material, and the author of this study does not exclude speculation

1.7. The importance of oil production as the main source of income for Libya

Libya is the largest owner of oil in North Africa. Officially, the size of resources is estimated at 36 billion barrels. However, the Libyan resources have not been accurately

measured. It is speculated that, in fact, Libya may own three times more oil than it results from previous measurements. If such assumptions are confirmed, Libya will become next to Iraq the largest oil producing tycoon in the world. In addition, Libyan oil belongs to the best quality in the world, and its extraction is extremely cheap. The cost of extraction is estimated at USD 1 per barrel, which can be sold with a fifty-fold profit.

Libya, during the ten years after independence in 1952, was a very poor country. It had all the features of an undeveloped country. The majority of the population was at a low standard of living, per capita income was very low, and the level of illiteracy and unemployment was very high. In addition, the country was characterized by low productivity, lack of qualified workforce, capital formation was equal to zero or even less than zero, and native entrepreneurship was practically non-existent. Of course, similar features could be multiplied, but suffice it to say that the annual per capita income was about 14 Libyan pounds (ie around 50 US dollars at a rate of 3.57 $ for one Libyan pound) [51]

The unforeseen discovery of oil in 1959 and the later generated national income completely changed the Libyan economy. Oil exports began in 1961 and the inflow of this income became significant until 1965.

The enormous potential for obtaining capital from local oil production comes from the fact that from all commodities included in international trade, crude oil has the largest range between the average cost of production and the price. The existence of this compartment is the basis for the creation of large capital by the local oil production sector

National income from oil production is the only source of income for the Libyan government. The importance of oil production goes far beyond its financial contribution. Oil production directly contributes to GDP (gross domestic product), foreign monetary exchange, payment balance, employment, energy supply and the use of domestic products.

However, the creation of national income as a result of oil exports is limited by the following determinants:

1. the price of production,
2. production cost,
3. production level,
4. ownership and management, especially when it is related to the distribution of benefits,
5. negotiating abilities of the parties, especially oil producing countries and operating enterprises.

The first three determinants are usually easy to determine, while the fourth and fifth can be estimated on the basis of indirect proof. In Libya for a longer period, the cost of oil extraction was a constant value, while the variables were productivity and price. These

main variables determine the increase in the national income obtained from the production of crude oil.

At this point, the concept of economic growth used in this dissertation is quoted as a quantitative increase from the period to the period of basic economic values in the scale of the national economy, and, above all, of the national income per capita. The pace, i.e. the dynamics of economic growth, is measured as the percentage ratio of the increase in national income (δD) to the level of national income in the previous period (D):

$$r = \frac{\delta D}{D} \cdot 100\%$$

where:
r - national income growth rate (synthetic)
D - national income in the previous period
δ - increase in income during the period considered during the year

The author of this work, on the other hand, defines economic development as both quantitative and qualitative changes in the socio-economic structure of the country, qualitative changes in the goods and services produced and changes in their assortment structure. It should also be remembered that quantitative changes (related to the concept of growth) lead in time to qualitative changes characterizing the process of socio-economic development.

The process of socio-economic development is a broader concept encompassing both quantitative and qualitative structural development of the national economy, ie both the development of productive forces and the resulting change in socio-economic relations.

National income created in the oil industry affected expenditures related to economic development or demand for consumer goods.

Table 1.1. The sectors in which Libya finances the income from oil

| | Expenses in dinars x $\cdot 10^6$ | | | | | | | | | | |
| Years / Sektor | Period before revolution | | | Period after the revolution | | | | | Economic restrictions | | |
	1955-1959	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1991	1992-1995	1996-2000	2001-2002
Light Industry	1,2	3,5	36,3	297,3	890,3	1951,1	499	400	300	280	270
Agriculture, feed industry	0,8	2,6	35,2	316,8	960,9	1436,7	316	200	150	120	100
Health services	0,2	0,5	10	69,1	229,1	353,4	77,2	72	60	54	50

Source: Statistical Handbook of Libya, Arab Jamahiriya Secretariat of Planning, Tripoli's (year 1980 – 2002).

The above mentioned table 1.1. presents the sectors in which Libya finances the income from oil. The charts 1.1 (profit), and 1.2.,1.3.1.4 illustrate the curve of economic development in selected three sections: light industry, agriculture and health based on table. 1.1.

Profit level in millions dinars (D) for objects I-VII
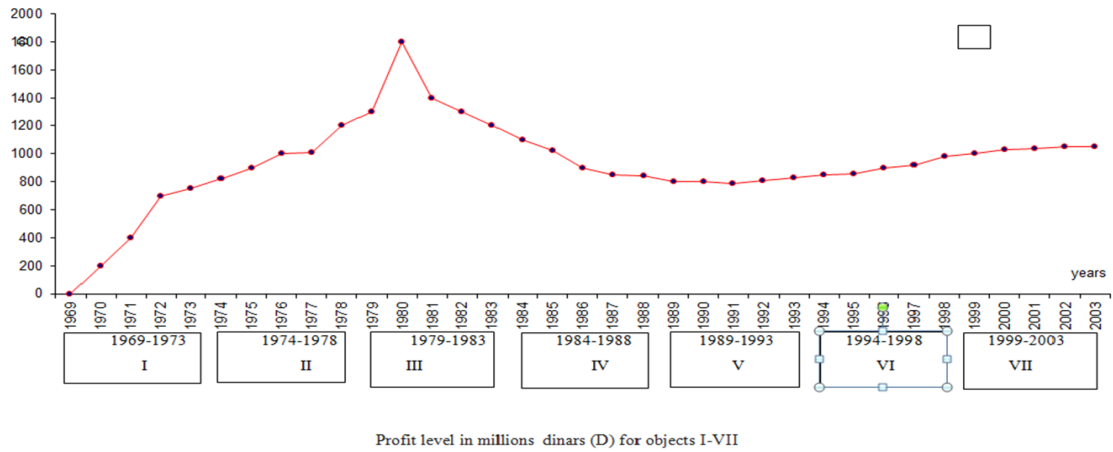
Chart 1.1. Profit in millions dinars (D) for objects (67)
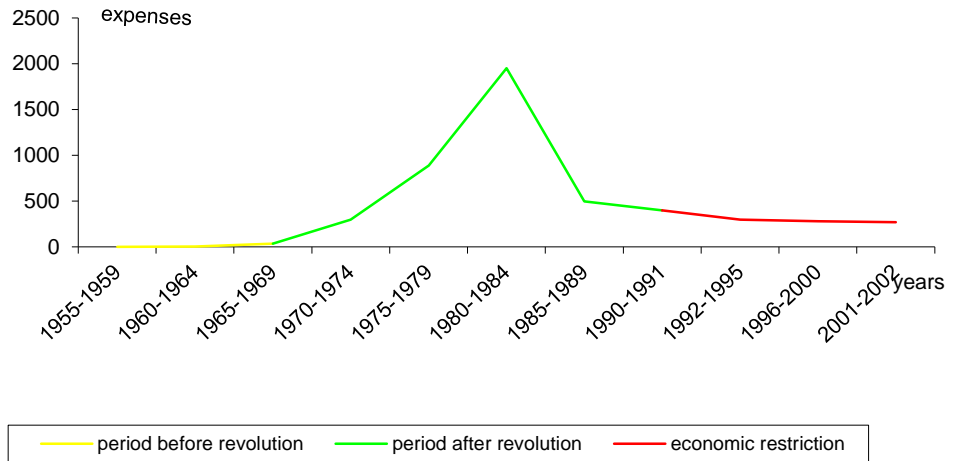
Chart 1.2. Expenses in light industry (in x $\cdot 10^6$ – dinars)- (67)
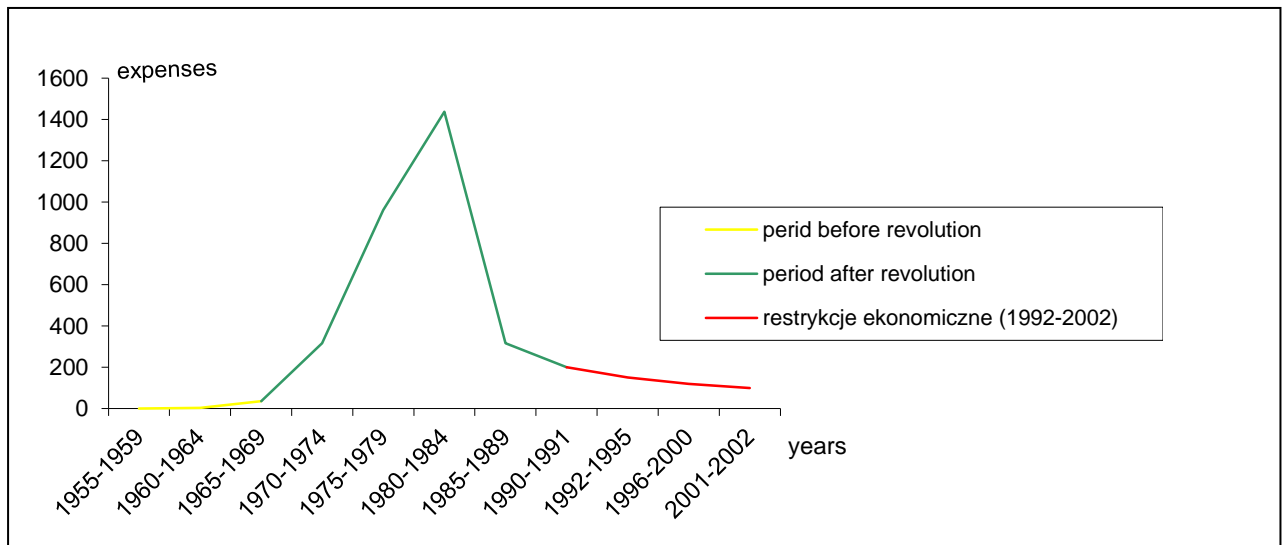
Chart 1.3. Expenses in agriculture and feed industry (in x $\cdot$ 10^6 dinary)- (67)
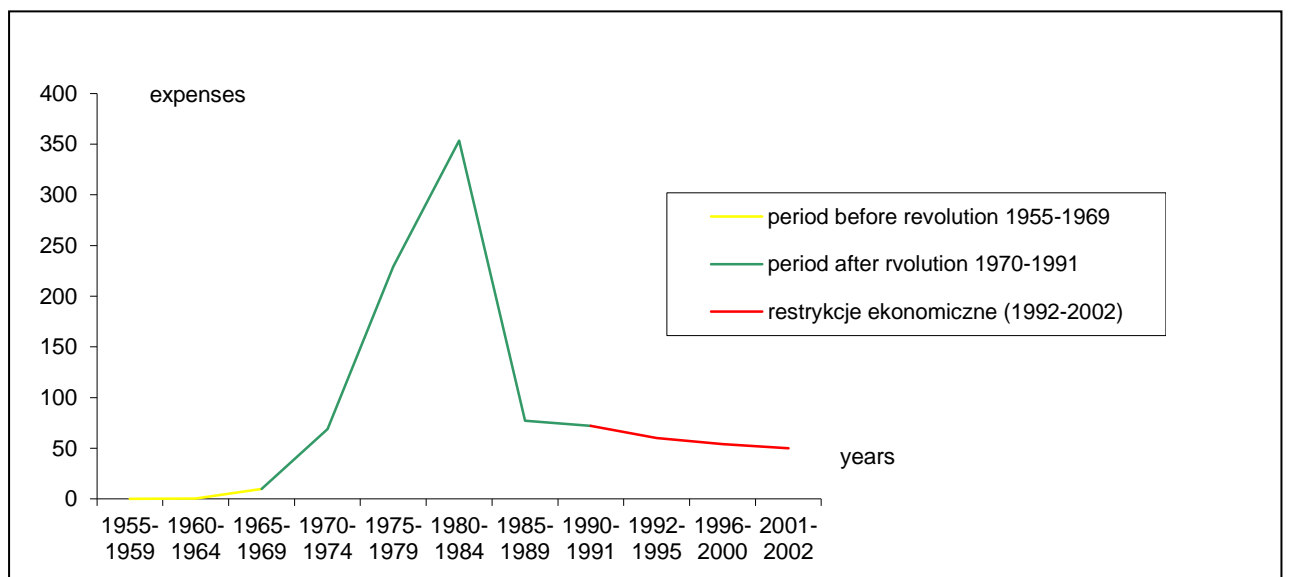
Chart 1.4. Expenses for Health service (in x $\cdot$ 10^6 dinary)
source: Own basing on (67)

History repeats itself. The political changes that took place on 1 September 1969 contributed to the economic development of Libya and made it a country for influence which both the West and the former Soviet camp sought. Currently, Libya's economic cooperation with many countries around the world is in line with the economic interests of all parties.

History repeats itself. The political changes that took place on 1 September 1969 contributed to the economic development of Libya and made it a country for influence which both the West and the former Soviet camp sought. Currently, Libya's economic cooperation with many countries around the world is in line with the economic interests of all parties.

Nowadays the Military Clashes in Libya followed by a political power struggle forced the National Oil Corporation (NOC) to a temporary stop of both extraction and export of oils (compare with the table of the economics of restriction).

From table 1.3. and Figures 1.3, 1.4, 1.5. it follows that the national income obtained from the production of oil was the sole source of income for the Libyan government. Oil production directly contributes to GDP (gross domestic product), foreign monetary exchange, payment balance, employment, energy supply and the use of domestic products.

1.8. The country's economic development policy and prospects substitution of fuels towards diversification

In the years 2004-2008 about 1.5 million barrels of crude oil were extracted from Libyan deposits a day [67]. Currently (2019), Libya wants to take advantage of the world's prosperity and increase its production. It is often necessary to build and modernize a network of oil pipelines connecting mining centers with ports and refineries. On the one hand, tens of billions of dollars are needed, which can only be provided by foreign investors, and on the other hand, all branches of the Libya economy depend on energy supplied only from crude oil as non-renewable energy sources.

Coal has been successfully replaced by kerosene as an energy raw material. The reduction of oil reserves and the lack of available raw materials put humanity in the face of the problem of an alternative replacement resource. In order to solve the increase in oil reserves in Libya, the government has plans to use renewable energy sources, such as:

    (a) Solar energy [solar],
    (b) Nuuclear [nuclear energy],
    (c) Sea wave and tidal;
    (d) Biomass [biomass].

It seems that oil replacement forecasts need to be resolved within two generations.

In Libya, the implementation of an energy plan is being considered according to two strategies [67, 58]

The first strategy:
Oil-only-strategy "OOS" [source of only kerosene]

Second strategy:
Mixed-energy-sources-strategy "MESS" [energy source diversification]

There is no doubt that the application of the first or second strategy depends on various factors in a given period, such as the costs of planned investments, availability of raw materials, development of the country, number of inhabitants, etc

1.9. The existence of a foreign monopoly and the integration of the state to protect society in Libyan conditions

Generally speaking, the market mechanism should allocate the resources of society at the limits of production possibilities and only in conditions of perfect competition - when market participants behave impeccably in ethical terms and in accordance with the valid ethic of Islam under Libyan conditions.

In fact, the Libyan reality, this state of affairs was practically never observed because market participants were and still are foreign concerns related to the exploration, exploitation and processing of crude oil. Thus, one can draw a conclusion here [45] that the market mechanism based on the mechanism of competition does not optimize the allocation of public resources, and the interference of the state in economic processes is a necessity. The functions of competition (as a guarantor of value, development of technical progress, optimal distribution of produced GDP, etc.) should realize social welfare in the basic function. Due to the imperfection of the market competition mechanism in the Libyan market economy such as:[58]

- The global demand for kerosene does not fully affect the stabilization of the domestic market,
- Foreign companies as participants in global market competition are not willing to respect Libyan law and are eager to use the protection of the country's home law in pursuit of gaining a competitive advantage over Libya by cartelization,
- Libya does not have full and free action in using its own oil fields, as a result of which the benefits of the oil market participants are differentiated,
- Libya has no free property rights in managing and negotiating prices, especially when the main determinants of the national oil income are, in addition to the price, costs and level of production,
- The operation of the global oil market competition mechanism results in the reduction of real income following the destabilization of the world oil market in the ideological and political aspect.

Analyzing these shortcomings or even errors of the market mechanism based on competition, in the theory of economics a public interest concept was established stating [39] that if the market does not work in the public interest, the government should join the economy by correcting its mechanism or directly dealing with production. Replacing the defects of competition could be further extended. At this point, however, I would like to concentrate on one, already mentioned drawback of the competition mechanism, namely the tendency of the market economy to create an oil cartel and to gain a dominant position on the market by oil companies using unethical methods.

One may find the opinion that "competition kills competition" [39], because the system of competitive relations in free competition caused that in the long run it prepared the

basis for a thorough change of the existing organizational structures of markets and the economy. Free competition led gradually and inevitably to phenomena which contradicted the conditions of the model competition [M. Noga]. The acquisition of a privileged position by individual companies was associated with the adoption of their achievements in science and techniques both in oil extraction techniques, in production methods, ways of organizing production, the structure of production links, as well as in the method and means of distribution.

Large corporations, thanks to their size, can influence the price, consumer decisions and the state. The claim, therefore, that a market economy system based on a competition mechanism is a rational system cannot stand the test of confrontation with economic reality [45].

The economic situation of Libya before the discovery of oil deposits was bad. With only 1.1 million inhabitants, a vast (1.7 million sq m) and desert country was devoid of cultivated land and any raw materials. Oil, extracted from 1961, caused a process of far-reaching changes. Unlike many other countries, many companies were granted licenses.

The output grew and in 1969 it surpassed Saudi Arabia's rates. Kadafi started his office by preserving the mining rights. Gaddafi's position was extremely strong. Libyan oil met 30% of Europe's needs and did not require expensive transport. Events in Libya have shown that the concession system is coming to an end.

Libya was a country in which the "fifty to fifty" rule created a precedent that was used by the sector of large corporations, where it is difficult to talk about the rules of competition similar to the canons of competition in the classical approach.

If competition at the beginning of the 21st century does not carry out such social functions as freedom, justice and prosperity, then from my point of view it seems necessary to interfere with the economic processes. Will this interference be effective? The answer to this question is related to the presence of oil deposits in the territory of Libya as a national wealth, and the state in the pursuit of self-determination must introduce regulation primarily to protect social welfare. There is no doubt that while oil extraction is relatively easy, it is only oil extracted, transported, processed and exported that is subject to market competition.

At the time when market failures, as a result of the monopoly, remove the state through its regulations, then from my point of view, the phenomenon of state errors as a subject of management in the allocation related to regulation may occur and that justifies state intervention in protecting society.

After all, the very functioning of the state is desirable from the point of view of the public interest and not from the point of view of maximizing the monopoly's profit as the goal of a free market. Regulation is also introduced primarily to protect companies already operating on the market before entering other forms of management.

The allocation of resources made by the state is not always effective, but in my opinion it should be stated that this situation is the result of the competition mechanism. This

competition mechanism was created by large corporations that now influence the state to make decisions that benefit the large corporations. After all, the state's interference in the management processes is to increase the efficiency of allocation of resources available to the public.

It should be added here that the state has the largest capacity among all economic entities to collect, process and disseminate information. This objective fact cannot be questioned and should be used in the process of increasing the efficiency of allocating the resources of societies.

Also not all human activities can be measured [7 M's] (52), especially it concerns the human resource (M4) and action in the choice of decision. That is why the role of the state in this respect concerns the stabilization of the country's level of development, which encourages or fails to invest - that is, the state must create a specific investment climate (46). It is well-known that no microeconomic theory or theories of the liberal trend of economics have yet created any concept of a market mechanism for generating full employment. Hence, the mechanism of market competition does not help in eliminating unemployment, but state aid is needed in this area.

In conclusion, the theory of public interest assuming supplementing the market mechanism through the production activity of the state that produces public goods from one country and the other eliminating negative externalities and countries that conduct antitrust policy is a theory corresponding to the requirements of the modern, democratic market economy. Critics stating that it is impossible to determine objectively what the public interest should be, it should be explained that this is only the case in the case of the neoclassical ground of economy, where the purpose of management is an economic category and a date (45). Therefore, the economy becomes a kind of mathematics that solves the optimization task, eg how to achieve a given goal using the least amount of funds. It is a shortage of neoclassical economics, unstable at the current stage of economic development. The goal of management should be taken out of the culture understood as "the entire material and spiritual achievements of humanity collected, perpetuated and enriched during its history, passed down from generation to generation" (Dictionary of the Polish language, PWN, Warsaw)

In my application the methods of improving the organization of an oil company will try to take into account the possibility of introducing synthetic features on the basis of which it will be possible to make a comprehensive assessment of the level of socio-economic development. This feature contains information provided by appropriately selected sets of features and can be treated as a measure of the level of socio-economic activity, under which social needs will be recognized and qualified as desirable from the national interest perspective.

1.10. Assessment of oil companies from the point of view public interest

There is a rich economic phraseological and sociological literature on organizational efficiency. There is a large variety of measurement concepts and organizational

effectiveness assessment. In this work, the assessment of mining companies from the point of view of organizational efficiency is made on the basis of the determinants of the level of organizational achievements of mining companies. Adapting in part the method of Fail Assessmet Methods - FAM (Method for Estimating Deviations) selected some indicators in the three levels of activity of these companies - the level of management organization, the level of technical organization and the level of economic organization.

Is it really a theoretical goal or practical goal to assess the level of development of an organization and the management of an oil company to achieve the "level of development of the similarity of the oil fields" or "level of development of the oil fields"?
Impacts of the organizational system on the level of development of the efficiency of the oil company's operation are not only to know the level of impact of the organizational system depending on the selected criteria, but to examine the state of the organizational level, interdependence and conditioning of the oil companies in the organizational system of the obtained oilfield groups as a result of classification.

The organizational level is determined based on the criteria characterizing the oil fields and the relationship between features and factors. Note that not all classes (groups) must have the same assessment criteria.

The task of the method of assessing the organizational level in oil companies in Libya is the classification of oil fields due to the factors characterizing it, ie the "level of similarity", which determine the "level of development" in a given period.

As a result of the division of oil fields, it is possible to distinguish classes concentrating fields according to a combination of the selection of features determining the level of development and factors conditioning the level of development of features, i.e. the level of similarity.

The implementation of this undertaking makes grouping (classification) conduct useful for practical purposes and for conducting comparability of oil fields for the purpose of preventive management and prevention of further deterioration of the organizational level. Also, by means of the designed rating system, it is possible to quantify and set indicators for the development of the organizational level in a given period.

The idea of classifying oil fields to various levels of development enables the rational use of natural resources. The decision maker can secure or introduce limitations on the required reserve raw materials that can be extracted at the planned export level.

Additionally, the classification program of mining companies facilitates the preparation of schedules enabling more economical use by mining companies of resources such as: labor (M4), materials (M3), machinery (M2) and financial resources (M6).

The classification of oil fields on the basis of resources can be made from the point of view of oil potential, as an important tool in the implementation of public interest policy

based on the evaluation of oil production plans. With past practices, the limits of oil production depend on the level of development in three areas:

- the level of the country's economic development,
- the level of social development of the country,
- the level of development of the country's political and social situation.

On the basis of the value of resources as well as their importance and type, the proposed system of assessment of oil companies is to classify and assess selected 17 mining companies.

In this work, the decision (selection of actions in the protection of public interest) depends on various parameters. On the one hand, their changes may in a way be predicted. In other words, it applies to a determinate situation in which only the parameters completely defined affect the effects of the level of socio-economic development. On the other hand, this applies to situations where these parameters have known probability distributions, such as the political and social situation from the ex post period, according to the password you know the past, to shape the present and plan the future (FAM method).

There is no doubt that the level of development of the state of stabilization of the political and social situation in the past is not the same as the level of development in the current period, because what was true in relation to the value of parameters determining the level of development in the past does not have to be true at all. " time now "(in addition to constantly changing characteristics and conditions) (FAM method).

The assessment of mining companies from the point of view of public interest, taking into account the issue of the political and social situation goes beyond the scope of this work.

1.10.1. Presentation of the companies under the name NOC

The petrochemical company analyzed in Libya is an institution consisting of four companies (Fig. 1.5) related to each other in this way, which allows them to achieve the most important goal, ie extraction, transport, processing and export of crude oil.

There are four enterprises (companies) in the work (company):

Company 1 C1 - Oil Well (oil well), which deals in crude oil production in the village of Pole Murzuk, located in the south-western part of the country.

Company 2 - C2 - Oil Pipe. In Libya, where crude oil is extracted, there are several thousand kilometers of pipelines, including crude oil pipelines - 4,380 km. **C2 only deals with the transport of oil through pipelines.**

Company 3 - Refinery - Ras Lanuf. Refinery in Ras Lanuf with a capacity of 198 thousand b / d was put into use in 1984, but its actual production is usually lower.

Company 4 - NOC (National Oil Corporation). The NOC company was founded on November 12, 1970 by virtue of the decision of Act No. 24/1970 on responsibility for activities in the sphere of oil. NOC oversees extraction, transport, processing and export through its own plants or through participation in contracts of other companies. In addition, NOC is responsible for exporting oil (88%), extraction and processing (12%).

14. Figure 1 presents the dependence of export on the extraction amount of oil
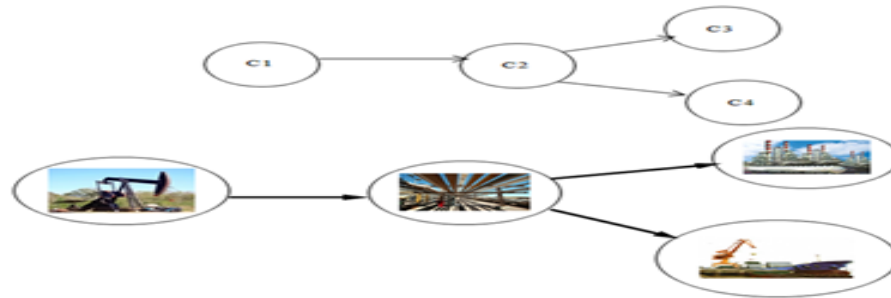
The petrochemical company in Libya is an institution consisting of four companies related to each other in this way, which allows them to achieve the most important goal, ie extraction, transport, processing and export of crude oil.

Figs1.5. The dependence of export on the extraction amount of oil (own source)

After this presentation in chapter one on the role of oil in social, political and economic life, in the next chapters I will continue my research about the role and the effect of good organizational level management in this branch on the development of Libyan economy and how to assess and to manage this level.

1.10.2. The prospect of developing oil companies in consolidation conditions

In the years 1992-2002, the activity of the oil sector in Libya limited the US trade embargo. During the embargo, whose implementation and enforcement was questionable, Libya continued to export oil to European countries. First of all, the proximity of this country, the quality and quantity of strategic raw material meant that Europe was reluctant to look at the embargo demanded by the United States.

The economic relations of European countries with Libya remained at a high level due to the dependence of Western Europe on Libyan oil (about 75% of Libyan oil was directed to Europe, and the cost of adapting equipment to lower quality oil was estimated at USD 800 million). In addition, Libya still had significant support among developing countries. In summary, it was a difficult period for most companies, where there was a need to reduce costs, reduce debt and patch budgets. Enterprises had to choose between lonely drifting and undertaking cooperation with highly developed countries as part of the consolidation of companies, both in the broad and narrow sense of the word [49].

In 2004-2008, in Libya, Americans and the British also showed interest in the purchase of crude oil in Libya. The reasons and motives of making consolidation decisions result

from a number of factors, both internal and external. Initiating consolidation processes is to achieve a number of goals that could not be realized in the case of a self-operating enterprise. The history of past years indicates that the transition from the prevailing economy controlled by the Libyan state to the process of restriction of state intervention is indispensable. The main difficulty is the need to overcome the expected internal and external economic problems for the new situation of companies.

1.10.3 Consolidation in legal regulations in the world

The different legal systems of individual countries delay consolidation processes on a global scale. Therefore, the need to develop consistent international legal regulations in relation to the functioning of large associations of enterprises is indispensable. The diversity of legal acts and regulations in the world leads to unfavorable phenomena both in the market and in the political sphere. One of the organizations that have a significant impact on the formation of international regulations in the area of functioning of economic groups and increasing the efficiency of capital markets is the International Securities Commission (IOSCO), based in Madrid, which was established in 1983 by the authorities supervising the securities market, bringing together 172 members, including Libya.

Another organization of this type, which affects not only the shape of international financial reporting, but also other matters related to the functioning of consolidated structures is the International Accounting Standards Committee (IASC), which was adopted in 1973 by 16 professional organizations related to accounting.

There is no doubt that the diversity of law in this area in individual countries makes the consolidation processes of enterprises more difficult. Therefore, in my opinion, it is necessary to develop and improve transnational solutions in relation to consolidation processes in the world. However, legal systems in Europe are still very different from each other, thus hindering the functioning of economic groups on an international scale. Most often, consolidation processes were carried out in highly developed economies, both in the European Union, Canada, and especially in the United States, which clearly dominated in terms of the size and value of transactions.

The oil crisis on a global scale in 1974 caused companies in Libya to be seriously tested. The previous management methods, and above all the methods of forecasting the future, methods of assessing and estimating the impact of the "zone out" environment on the enterprise, in my opinion, have become outdated. This period, however, brought the development of analytical and prognostic techniques, which are used and repeatedly are a source of inspiration to create more and more perfect scenario methods. In this new, difficult situation, in the conditions of crisis and increasing global competition, enterprises have been forced to look for new and effective new methods and management methods. However, oil companies were cautious to cooperate in consolidation due to the differences in Libyan legal regulations.

The oil crisis of the 1970s was a factor that caused considerable interest in the international fuel market. Enterprises realized that the market is above all customers and

competitors. This is the beginning of the lesson, what methods should be applied for clients, how to strive for them, how to create them. It was also a lesson on how to deal with competition. The main areas of interest are: products, prices, distribution and promotion, and market research (customers and competitors). In marketing management, external long-term planning has been quite commonly used.

The author's proposal is to attempt to construct a method /system of assessing the effectiveness of the company's operations that could raise the level of management in the petrochemical industry in Libya. The application value of the work will be particularly important. The ambition of the author of the dissertation seems to be designing an evaluation system that could significantly contribute to the development of the petrochemical industry in Libya and increase its competitiveness if used. This is important because the industry under investigation is managed in a prescriptive manner.

At this point, the question is whether the assessment and management systems themselves are able to bring economic effects without support in the form of systemic changes? In the recent period (about 10 years), the process of limiting state intervention in business operations has been liberalized and Libya is currently experiencing an era of free market economy, while retaining, however, some regulatory mechanisms to protect society

Therefore, the Management by Fail method proposed by the author of the dissertation is a tool for supporting, researching and detecting what dominates in the process of assessing the development of the oil sector's development strategy in a tie of dependencies, phenomena, events, states, in order to make and choose decisions regarding adaptation of economic opportunities to Libya's internal and external situation by measuring the stabilization of the level of development of companies in a given period.

II. APPLICATION PART
CHAPTER TWO

ASSUMPTION, GOALS, HYPOTHESIS, THESIS

2.1. The selecting Materials (see chapter 1 point 1.10.1.)

Due to the fact that the practical values of this dissertation were supported by an example taken straight from the practice in the conditions of economic restrictions imposed on Libya to external factors, one can count the fact that highly developed countries have not completely lost their political and economic influence on Libya. The more difficult Libya's economic situation is, the easier it will be to apply various pressures, starting with import bans of modern technology, ending with the introduction of economic sanctions.

In order to illustrate the need to implement a computer, modern management methods (in the absence of specialized scientific-research and development institutions) in the work of a manager as a tool of the contemporary organizer can be used the following case.

The subject of the continuation this study will be a further study of choosing (three companies of extraction the oil (see chapter 4) concerning the identification and analyzing the impact of internal and external factors on the financial condition of these companies as well as the principles and tools of management with CONTROLLING STAGES in the three chosen companies to be compared with others indicators of development of the 20 companies investigated in this research.

The start point of my research was my historical visit during the restriction in one company where I was invited as a free listener at the management meeting of oil lubrication companies **to develop a project to modernize** the lubrication oil plant department and to **improve the quality of the packaging**. The modernization of this facility was included **in the plans of the Ministry of Economy and Development.** As the participants of the meeting seemed to be **very knowledgeable about the management of the company**, the decision to implement the project was made "after a brief exchange of views".

In my opinion, the work on the preparation and approval of the modernization project should be in line with the **scientific principles of the organization**. Unfortunately it was not!
First of all, the main goal was not fully understood. Some believed that the main goal was to reduce production costs (but not to mention what part of the costs was involved), others argued that the goal was to increase the quantity of finished products, etc. The analysis of the measures needed to modernize and analyze market demand was also not analyzed.

For the author of the dissertation, the main aim was to examine the <u>conditions</u> and means of achieving the intended goal as productive (elementary and disposable) <u>factors</u> <u>t</u>hat can be valid during the implementation and in the post-modernization period, such as:

- Maximum production capacity (daily).
- planned quantity of products (per day).
- Number of production workers,
- the amount of modernization expenditure,
- The wage labor fund,
- Nominal machine hours for changes,
- The planned number of stoppages,
- The amount of internal and external transport.

Based on my historic visit, the Organizational and technological progress applications, as internal factors, can contribute to the modernization of companies, especially under economic restrictions, because of the limitation of access to new "technical progress

At present, organizational units in Libya should focus on conducting scientific and technological activities in the industry. In general it is not. An example is the wrong conclusion of licensing agreements in various industries. It is said that licenses are the shortest way to modernity. This is undoubtedly true, but does the road really have to lead to the modernization without good management and organization, as in the case of Libya?

There is no justification for the purpose of innovating the above mentioned issues without defining the functions of ORGANIZING and CONTROLLING and clearly described the condition or state to organize the activities and actions in the company and the function of controlling as a complementary tool gives truly information of the company's functionality.

Based on this example, it can be concluded that the application of Technical and Economic progress as internal factors can contribute to the modernization of companies, especially under conditions of economic restrictions due to the limited access to the novelty of "technical progress". Currently, organizational units conducting scientific-research and development work in Libya should focus on conducting activities in the field of science and technology in industry. It is not usually like that. An example is the erroneous conclusion of licensing agreements in various branches of industry. It is said that licenses are the shortest way to modernity. This is undoubtedly true, but does this path really have to lead after so many troubles, as in the case of Libya?

Beside this in Libya we are powerless in the face of another threat such like choosing a rational licensing agreements by Libyan companies. Till now it was made on an "ad hoc decision" basis. The possibilities of cooperation on the part of domestic cooperators were not studied, which caused material tensions, investment delays and costly extensions of implementation cycles.

During the period of restrictions, the Libyan companies had and still have difficulties in obtaining the necessary elements and parts from foreign partners. This stems from a brief review of activities in licensing undertakings, where there was an unfavorable ratio of outlays and effects – as an example in the case of color TV monitors - it was mainly a derivative of supply and cooperative problems.

From my point of view, when concluding a license agreement, you must first learn practically everything, starting from the mode of purchasing a license and ending with preparing staff for a new production.

2.2. HYPOTHESES, STATEMENTS AND POSTULATES

In order to achieve the stated objective of the dissertation, the author intends to put a research and research task, covering the full research cycle: from searching for an adequate theoretical model of the problem and its solution to empirically verify the developed assessment system in this work.

During the collection of materials for work and interviews conducted by the author with economists, statistical experts, managers of economic units and, of course, politicians, the author formulated the following hypotheses, statements and postulates:

1. The inevitable transition from a state-controlled economy to limiting State intervention is the need to overcome the expected internal and external economic problems for a new situation in the operations of companies.

2. Lack of specialized scientific-research and development institutions in Libya, undertaking appropriate economic and technical activities, the aim of which is to assess the level of implementation of economic tasks on a micro and macroeconomic scale during the period of economic planning. *Therefore it is absolutely necessary to apply a modern network planning with modern management*.

3. Computerization of management in various sectors of the economy of Libya may encounter high costs of building computing centers and the need to break old, old habits, change existing thinking, change the organizational structure, responsibilities, which may hinder the implementation of current production tasks.

4. Restrictions on the role of the state in the enterprise's activities are met with active resistance of some state-owned decision-makers.

5. The dependence of the activation of the process of economic and social development on income from oil hampers the innovative process of the oil company.

6. The investment strategy of an oil company is to a large extent focused on easier management of personnel, bypassing production projects.

7. The involvement of income obtained from oil production in the country's investment programs is constantly growing, despite the small income of this sector.

8. The deficit of skilled labor has a major impact on the efficiency of this sector.

9. The company's activity in the globalization, liberalization and privatization era of the

economy makes it necessary to look for simple, effective methods and systems to support the management and assessment of the level of development of functioning in this industry.

10. Issues related to environmental protection in Libya gained in importance relatively late. Therefore, stable economic development will be a guarantee of making sensible decisions related to the threat of degradation of the natural environment resulting from the development of oil production.
Based on the formulated goal and hypotheses formulated in this way, the following thesis can be put forward as part of the concept of the research process in the dissertation.

2.2.1. The role of the manger and network planning within the essence of management

Both in theory and practice there are many definitions of management, among which one can determine at least three approaches "fig.2.1": institutional (people to issue orders), functional (functions or activities that serve to direct objectives to achieve goals), operational (these are activities or functions related to time and place of operation and receiving a company on the market).

Note (MBC): Motivating - to be managed through (by) rewarding, while innovation to be managed through modernization (Controlling stages)
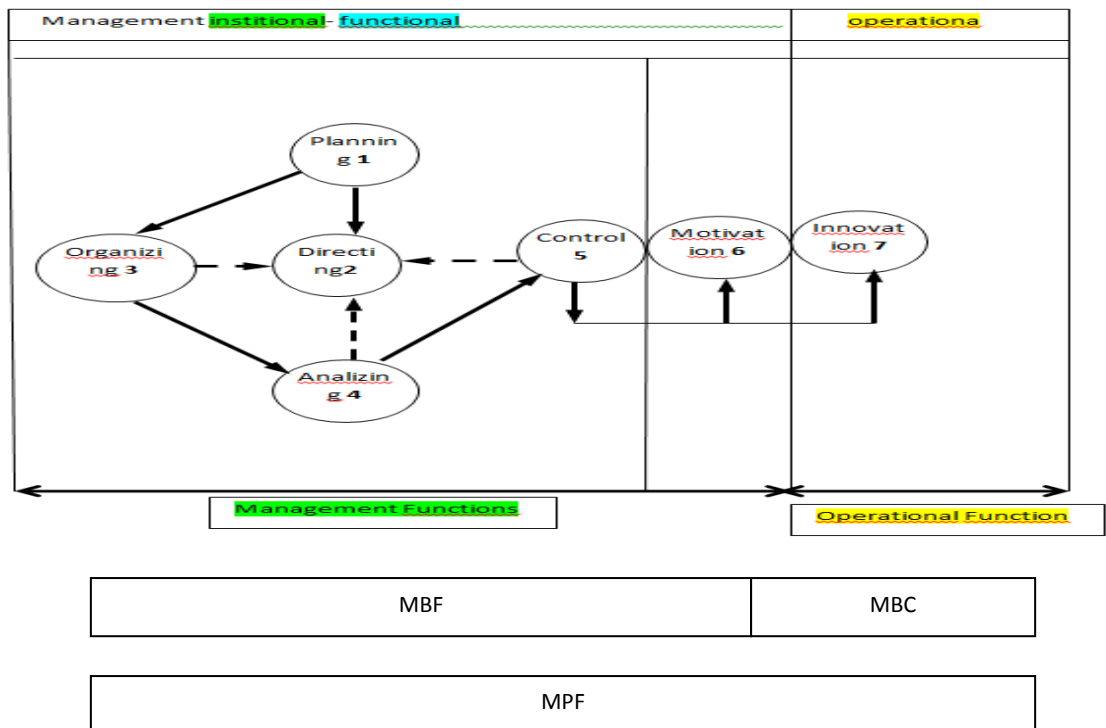

Fig 2.1. The role of the manger and network planning within the essence of management

Source: Own study

The purpose network analysis in this work of extreme importance to the planner of network for the process of extracting, transport by pipes and export of crude oil by NOC . Therefore the planner of the network focused on the all activities to finish the project in the planned time. So in the current time and according to the method of FAM the planner must give the time its importance for the implementation of the plan in the current time. According to FAM's Philosophy the planner must return go back in Time Now to the past and to give his attention to those events that have failed in the past and had troubles in implementation, i.e. focus on all activities and events in the network according to the drawing in Fig. 2.2.

According to FAM every experiment in the real life or any calculation by using the procedure of FAM to be described makes use of other periods of time in additional to the date known in FAM as 'Time Now" we use the idea of "**C**urrent **T**ime ,, and "**E**nd **T**ime", or "Final time" See the diagram in figure 2.2.
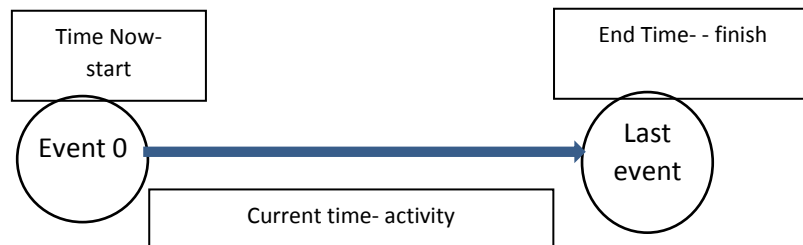
Fig 2.2. presents nodes, activities and times in FAM's experiment

Time Now: This is the date which the computer system the "program" assumes to be the moment or the date of the start the experiment.

All work to be done is placed after time now; all progress reports must refer to a date or event, activity or actions after time now.

Current **T**ime; this refers to the actual start of the activities in the experiment.

End **T**ime; this refers to the last event in the experiment.
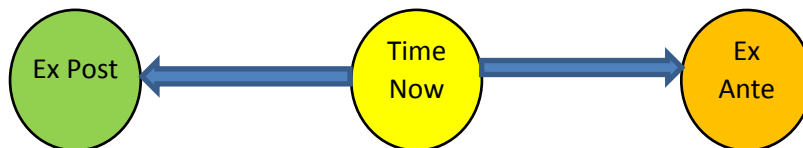
Fig. 2.3. Time now according to FAM

In Time Now "fig.2.3" we are responsible and grieved what happened in the past and we worry about what will happen in the future. TN is always accompanying us in real time and decides how to view our inquiries using the past time to shape this reality, and to avoid any mistakes in the future.

To move an event with a state of fail (similarly like a feature or an activity on the critical path), and to be moved and supported in time now we should correct it in the

theoretical experiment towards the future . The following illustration presents the difference between the period of an activity and the present time in the experiment of FAM as Time Now   in the formula S in this method (see. Fig.2.4) .

As mentioned before the assessment of the Organizational Development Level is taken in the period 2015-2019. This periods represents the "TIME", consisting of three elements: already known and experienced, as Ex Post , just experienced known as in Time Now- and the unknown and uncertain, as Ex Ante –Future. That is mean assessing of the period 2014-2015 as the Past, 2016-2017 assessing in Time Now TN and assessing for the year 2018 as Ex ante,
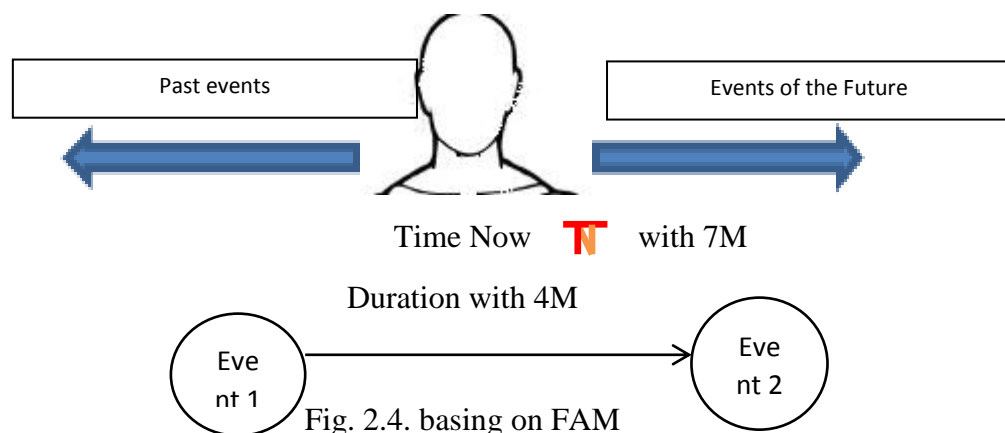
Fig. 2.4. basing on FAM

Generally, the idea of Time Now presents that, only tomorrow day may be free from errors, that are why today in we improve errors of yesterday in TN in order to obtain a tomorrow day without errors.

It means according to FAM algorithm which guarantees you a copy of the Past, to which the input is given in Time Now reliable information that is the output stream of information, which describe the required accuracy with which the copy was in the past and to correct the past for the future need as the model of the future.

Therefore the discussed MBF-DSD system is effective when it correctly maps the properties of the level of organization and management according to the algorithm of the MBF.
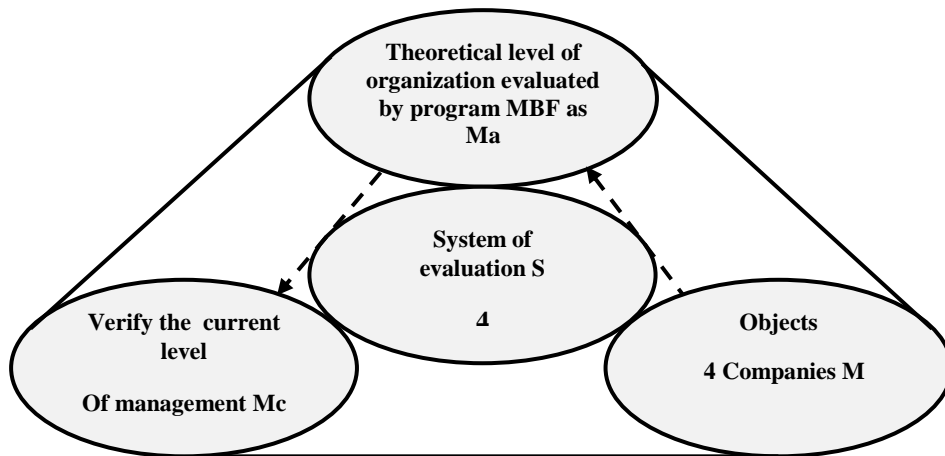
Fig 2.5. Elements of the MBF-DSD system and mutual relations between them .

 (Source: own study basing on FAM) .

It consists of the elements shown in Figure 2.5. where:

M - a test object, i.e. a collection of 4 oil companies, included in the experiment,
Ma - theoretical - hypothetical level determined by the evaluation program,
Mc - the level of the organization to be verified,
S - evaluation system.

2.2.2. The problem of assessing and managing - MBF

The research of the Ph.D. describes in fairly general terms the MBF method to be connected with Management Networking Principles of the Management Functions and the constructed systems of evaluation which deal with the three components (levels) of managing the fail by the general director as the High Level of management and mid-level of responsibility as shown in Figure.2.6.
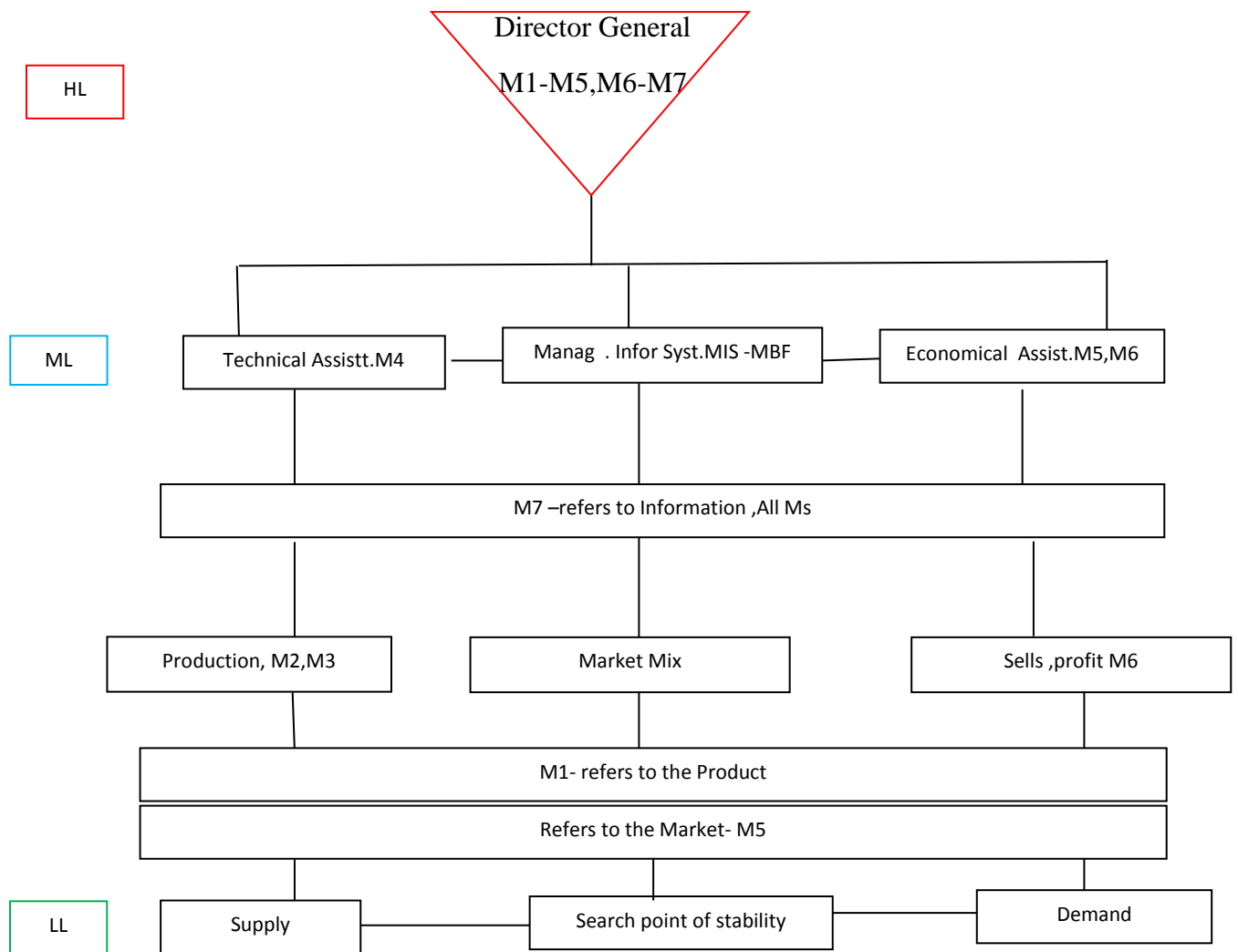
Fig 2.6. The level of management

source: Own study

2.2.3. Chosen the population of 20 companies and their assessing - Degree of Development EA in the DSD system

In the proposal Method - MBF a particular unit of measurement the extent of range of the level of development of a company in both time and spatial was constructed and denoted with the symbol EA This measurement used for assessing the stability of *development level* in a company. The new measurement denoted with the sign EA as degree of the development. We must take in concern that, the measurements of the development includes in its extent the assessing in time and space two other measurement that are the indicator of performance EA_p in the company and the index of similarity EA_s to show the relative level of similarity development level compared with that of a previous date or in another company.

Presentation of the Petrochemical Companies

The petrochemical company in Libya is an institution consisting of four companies related to each other in this way, which allows them to achieve the most important goal, i.e. extraction, transport, processing and export of crude oil as follow:

 C1 - Oil Well - extraction of oil.

 C2 - Oil Pipe transportation.

 C3 - Refinery- a factory where the petrol is refined.

 C4 - NOC (National Oil Corporation), presents central supervision over the all firms that are part of the NOC.

The role and the importance of the oil industry in Libya's economy results from the role of oil as a basic and usable source of national income . The oil industry as an important branch of industry includes the extraction of oil by the company (C1) transport by pipelines through the company (C2), distillation by the company (C3) and export of the oil by the company (C4).

The hierarchical nature of the export system, under which a responsible is the company C4 within the corporation (NOC), has a special impact on the efficiency of oil exports. The export dependence is, therefore, the result of the activities of both oil extraction and pipeline transport for export.

That is why I devoted this to my doctorate to propose a working system of controlling the extraction the oil within the scope of offering a Central Supervision Management system to assess and managing each company of the National Oil Corporation.

2.2.4. Objectives of the research

Inspiration for the problem of research work boils down to seeking maximum simple and effective methods of research support and detection, which dominates in the process of assessing monitoring and implementation of the organizational stability, Technical and Economic Levels of Development in a combination of dependencies, phenomena, events and states, in order to and choosing decisions to adapt the capabilities of these levels to the situation and the internal and external environment of enterprises.

Therefore the research leads to construct a new static and dynamic model to evaluate the organization level of management In the National Oil Corporation-NOC.

Superior goal

Concern the assessing, managing and to follow the productivity actions and performances activities of extraction the "Developing Product" to avoid the Failure.

1. General objective

To determine the requirements of the company's resources in different spheres (with the FAM 7M).

2. Indirect purpose

Concern the increasing the effectiveness of the innovations and raising the level of development of management as general.

3. Immediate objective

of this work is identification the potential danger of bad organization and to support and improving the utilization the procedures in the FAM method that can fulfil several different functions.

The petrochemical company in Libya is an institution consisting of four companies related to each other in this way, which allows them to achieve the most important goal, i.e. extraction, transport, processing and export of crude oil.
Figure 1.5.(page 40) presents the dependence of export on the extraction amount of oil.

2.2.5. The doctoral thesis

Based on such a formulated goals and on the presented research material as well as the work hypothesis, the following thesis can be put forward:
It is theoretically correct and practically useful to develop a method of measuring, assessing and managing the Technical and Economic levels into petrochemical enterprises in the field of productivity and performances basing on a chosen criteria allowing to accept the Technical and Economic levels in which the decision maker choses the highest grades and indicators for both the products and performance of work, in the current time to achieve a sustainable Technical and Economic level of *Developing Product* basing on the plan of productivity, performance and export tasks in a chose period as a new conception of innovation to avoid the Failure (***ex post ,time now ,ex ante***).

II. APPLICATION PART
CHAPTER THREE

METHODS, CONCEPT OF EVALUATION AND DECISION MAKING

3.1. The statement of the exact meaning of FAM''s terminology

The time has come. It's time to solve the problem from the previous chapters. Without this chapter there is no way to solve them. That is definitely correct, the level of the company's operations basing on the levels of Technical and Economic activities of the company is basing first of all on efficient ORGANIZING AND CONTROLLING.

It is the improvement of the existing ones as well as the design and implementation of new systems of management processes and technical and economic processes. The assessment of the organizational level of the enterprise in this work is to be done using the Management By Fail method - management by assessing deviations. The MBF method is designed to recognize the "image" of the stabilization of the company's "functioning" on the basis of the current level of development of the company's organization, which includes three components:

1. Organization of the management system,

2. Organization of the technical system.

3. Organization of the economic system.

These components are recognized together and related to each other, they constitute the basis for stabilizing the levels Technical and Economic organization. The assessment with the use of MBF is made on the basis of seven components, the so-called "Pyramids of resources and products in the FAM method". The management system component deals with innovative issues in the field of a dynamic approach to the management of a petrochemical enterprise in the direction of modernization and launching continuous improvement processes, improving the method of oil extraction, transport and distribution. The technical component determines the activities and tasks of the intended mining method improvement project that is actually in line with rationalist assumptions (i.e., needs). The economic component is the necessity to strive for the economic development of the company, which means that the cost of modernization is profitable in relation to the oil production targets.

The FAM method is a dynamic method that verifies each element of the set separately and at the same time the whole set together. Apart from the data resulting from it, it can be confronted with reality. Besides, when it comes to credibility, the trick is that the conclusions should be in line with what has been known to date. And if the current knowledge confirms these conclusions, we can look for such regularities that the current knowledge cannot confirm because it does not know them. Of course, the results of research based on a large collection may also correct the possessed knowledge Selected items in the literature dealing with innovative problems in the field of dynamic

approach to measuring and assessing the level of development of objects. In this part, I presented the assumptions, genesis and essence of the Deviation Estimation Method,

emphasizing the role and merits of the author of this method in its development, combining individual elements of Multivariate Comparative Analysis (WAP) and Multi-criteria Analysis into one coherent method for solving specific research problems. In-depth knowledge of the theoretical foundations of this method, originally developed as research tools in the science of enterprise management (for continuous monitoring of the company's activity in order to detect, explain and prevent possible deterioration of its condition), allowed for the creation of an algorithm and a computer program enabling the use of this method in evaluating the level of organizational development in oil companies.

In countries with a stabilized economy, changes are a consequence of technical development and wide application of modern technology not only in manufacturing processes, but above all in management. It is possible to manage the level of development of a Developing Product on the basis of many conceptions, among them the conceptions of **4P** and **4D.**

Therefore, moving from theory to application the principles of protection against the Failure to create a new strategy at the enterprise level of development. It should manifest itself in the implementation of addition of so called in FAM method four **P** & four "**D''** to the "**4M**' to aggregate the "7M" of FAM as follow:

1. The conception of 4P with **Market Demand** to be applied with the **4P** concept to **fill a gap in the market** as follow

1. Product (Developing Product DP- the need of "Zone out"customers),

2. Price (to fix a reasonable amount of money),

3. **P**romotion (sales promotion by advertising – to increase the sales),

4. **P**eople & **P**laces (supply to various **P**eople and **P**laces – the Market).

While conception of **4D** was applied to satisfy the **Environment Cleanness** as follow:

1. **D**efine – Define New Goals -this is the focus on setting goals to be achieved according to the current requirements- "Developing Product to protect the environment"

2. **D**iffer - goals must be different than the current one-not harmful with reasonable price and cost

 3. **D**istribution –Supply & Demand to satisfy the market without the power to harm the environment by introducing changes through the use of all sources of innovative ideas and in a different approach to people and places,

4. **Delight** –Delightful to determine the request for a Cleanness Environment in the work process, in improving interpersonal relations and their motivation to work, and in

the production process, in the direction of protecting our environment from harmful technology.

The source of companies efficiency is human work, his inventiveness and skillful use of them, which largely depends on the practical implementation of all functions of company management, among which the *organizing* function plays an important role, while controlling plays an innovative role and receives the company on the market. The aim of this chapter within this research is to provide knowledge about solving management problems and organizing as knowledge applied in management and controlling as practical tools to assess the condition of enterprises use theoretical and practical assumptions for this purpose by application the FAM deviation assessment method and the S model. Chapter one and two within the first part of this research is of general character, demonstrates clearly the problem of productivity and work in the National Oil Companies-NOC while this chapter presents the propsal method of proceeding in solving management problems as the basis for making managerial decisions, especially in the conditions of introducing changes.

Chapter four is a continuation in the reality to apply the presentation of the applied knowledge in chapter three and describes the evaluation systems to be used in the implementation of the organizing function at individual stages of the process of solving development problems in relation to various areas of the company's activities. As mentioned in the past chapters the concept "level of development" in this research is based on the FAM's theory for investigation the problem of assessing and managing the equilibrium[6] of the active[7] items, systems, phenomenon etc. The research problems cover such issues and phenomenon such like the equilibrium balance[8], stable[9] and stability[10] in every field. FAM deals with 3 different states of equilibrium as shown in Figure 3.2.(page 59). On the other hand FAM defines the term equilibrium as a situation in which assessing and managing opposing are balanced and under control for the active items functioning to check their stability. For this purpose in FAM we deal with so called " Stable equilibrium", that is the state of operation or working.

FAM's Management in the decision making process with Management Protection Failure (MPF) to measure, assess and manage the FAM Business Functional Deviation –BFD as a key into the MBF procedure within the applied methods in this study.

Finally, I want to add that *in the third and fourth chapter, the 7M tool in the FAM Method, was used because it allows both the use of the organizing function in practice for the implementation of the organizing stages, and the role of controlling in the practice for checking the company's activities related to reality and is to be consistent with the desired state*

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[6] A situation in which opposing forces, influence, etc are balanced an under control.
[7] Engaed in a particular activity functioning in operation or working.
[8] The even distribution of weight so that something remain steady (stable).
[9] Not likely tofail or change
[10] The quality or state of being stable.

3.1.1. The Methods applied in the research

I. Management Science and FAM Management (52)

      1. Network of Management's Functions NMF –Business Planning

      2. Management of Business Functional Deviation – MBD (like MPF, MBF,)

II. Multidimensional Measuring, and Multi-criteria Assessing –Management, analysis and decisions choosing

      1. Steinhaus Algorithm -Wroclaw Taxonomy (68)

      2. Bellinger algorithm – econometric (12)

      3. Pilawski Method – Cloud Method (32)

      4. Hellwig's Method – Typological Division and level of development (27)

      5. Fail Assessment Method FAM – Cluster Method- connected with Development level and Failure measurement. (52).

Notice :

AD 4 – that is a taxonomic method for typological division of elements of sets according to the level degree of their development and their grade of similarity.

AD 5 – the proposal FAM method in the research presents a concept of comparisons between the items (elements) in two fields ;

1. The field of the productivity level (the *degree* of the level is to be measured by comparing the *amount* produced with time taken and resources used),

2, The field of the performance grade of level (that is a mark given for the *ability* and quality of the work, and to operate *efficiently* in the chosen time-place and with the chosen resources.

For the researcher (economist, doctor or engineer, to achieve the basic objective of his research with assessing the Failure, he must solve in advance the following problems:

1. First of all the researcher must choose the pattern model of developing. For example for the engineer or the economist, this may be a "Developing Product" of quality and standard, while for the doctor it is a "Developing Medical Treatment" to able him to choose an efficient medicine to cure his patient.

2. Determination the most adequate Characteristic Values in measuring and assessing the level of development of the individuals or the item.

3. Choosing the scale for the purpose of measuring to categorize the items or individuals according to their position in a group.

4. How to divide (classify) the individuals or item of the same economic or technical levels and their position in the chosen scale?

5. How to measure and assess the actions in order to give marks according to their abilities and positions?

 When deciding the apply the above mentioned issues, then in such a situation it is easy to gain the purposes of the research.

In this work, the proposal method could help answer the above problems That is mean how to categorize companies according to how they organize and control the process of oil extraction to determine the level of performance and production development.

That is not to be either a regression analysis nor an analysis of variance (means the extent to which something varies or differs from something else). Both these methods are usually used to solve this type of problem. A new conception of MBF for assessing the companies in order to obtain a :Cluster groups" according to the proposal Classes of Qualifications.

I believe that, my new conception is more appropriate from the theoretical-application and practical points of view, in the Libyan conditions, and at the same time easier to calculate.

I. Management Science & Management With FAM : Fail Assessment Method– Method of Cluster

Connected with **D**evelopment **l**evel, **S**imilarity **L**evel to measure, assess and manage the Failure, both Technical & Economic Levels (fig.3.1). FAM's Management in the decision making process with Management Protection Failure (MPF) to measure, assess and manage the FAM Business Functional Deviation –BFD as a key into the MBF procedure within the applied methods of this work as follow:

1. Management of Business Functional Deviation – MBD,

2. Network of Management's Functions NMF –Business Planning.

Ia. Assumption and circumstances of the Cluster Method connected with the "level of development"

For example any particular **population** can be examined with regard to **two levels** of development: (level of **productivity**[11] and level of **performance**[12]) in the **Technical Sphere**. The examination results ought to be presented in the form of indicators of development levels. *The phenomenon* of the **relationship between** the decisive features that determine the level of development of **productivity** (which decide firmly of the level of development as *decisive features* – that is the level of production), and the level of development of performance (that is the process to realize an action under a special conditions where the result will be decided by many different factors, to act with different actions to show deference or similar action to decide the abilities of the performance of an individual as a *conditional factors*).

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[11] Efficiency, especially in manufacturing , measured by comparing the amount produced with time taken or the resources used to produce.

[12] An action or achievement, considered in relation to how successful it is
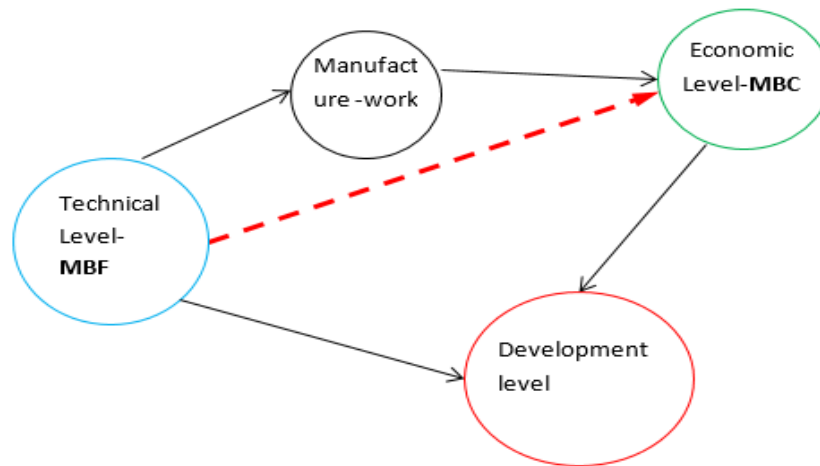
Fig. 3.1. Network of IT in Assessing the Technical and Economic Levels

source: Own study basing on FAM

If a researcher obtains a class with a number of individuals in the population with highly indicators of development level of productivity "degree of productivity on the basis of DF" as well as the same numbers of individuals with highly indicators of performance development level, "grade of performance on the basis of CF", it is assumed that the highly degrees level of development on the basis of the "DF" stands for the formation of the examined phenomenon according to a certain regularity, whereas the DF and CF are supposed related (binding) to each other to fulfil useful function and this fact proof the correctness of the presented assumption. It is statistically proven in the all researches investigated with the FAM algorithm.

3.1.2. "Level of Development"

The concept of the "level of development" stability in this research deals with construction a tool for measuring the functional operation level of objects in a "state of stable equilibrium" as a tool of measuring the stability , and to be presented by "the degree of the level development".

3.1.3. Degree of Development EA in the proposal system "DSD"

In the proposal Conception - MBF in this research a particular unit of measurement the extent of range of the level of development of a company in both **time and spatial** was constructed and denoted with the symbol EA This measurement used for assessing the stability of *development level* in a company. The new measurement denoted with the sign EA as **degree of the development**. We must take in concern that, the measurements of the development includes in its extent the assessing in time and spatial two other measurement that are the **indicator of performance EA_p** in the company and as the index of similarity EA_s to show the relative level of similarity development level compared with that of a previous date or in another company.

The idea of the balance measuring and managing by individual-regulation (by the manager) for the functionality is to maintain or restore the state of equilibrium as a result of internal operations, despite the changing from one state to one state of the operating conditions (external or internal) and changes within the operation, reducing its effectiveness towards the "Fail".

Individual-regulatory mechanism that allows maintaining the prescribed limits of the values of any variables of the functioning is based on the action of positive feedback. Interference giving rise to cause disturbances in balance in the system of managing having the ability to regulate in the direction to maintain or return to equilibrium. The process of individual-regulation can be either parametric or structural.

The object or a system is in equilibrium if and only if its components are in a state of partial equilibrium. (see the illustrative drawing Figure 3-2 showing the three states of equilibrium). It is a distinguished set of three states of equilibrium as follow:

1. If a rigid body (object), when subject to a small disturbance from a position of **stable equilibrium** tends to return to that position "state" it is said to possess **positive stability** or to be in a state of **stable equilibrium**
2. If following the disturbance, the excursion from the equilibrium position tends to increase, then the body is said to be in a state of **unstable equilibrium** or to possess **negative stability.**
3. If, following the disturbance**,** the body remains in its new position, then it is said to be in a state of neutral equilibrium or to possess **neutral equilibrium.**
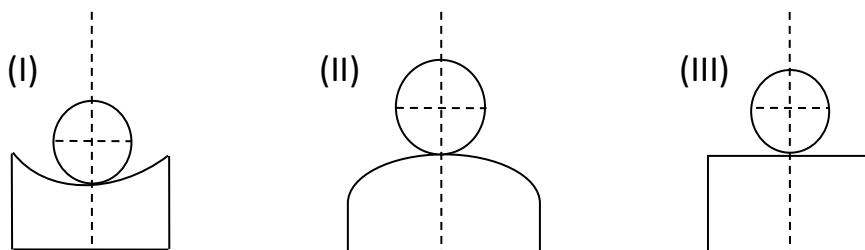
Fig 3.2. Illustrative drawing showing the three states of equilibrium:
I. stable equilibrium "constant"
II   unstable equilibrium
III. Neutral equilibrium
(modified by FAM to connect unstable E. with the "moment of Failure")

The concept of "stable equilibrium of an object" involves the concepts of "stability „and "ultra-stable" (stabilization). If the feedback existing in the item of managing do not allow to change its state without changing the structure (i.e. the diversity of the object functionality unchanged), we have to do with the stability of the functioning. However,

the diversity of the functionality response to changing operating conditions or changes within the functionality may prove insufficient.

Maintaining a balance is then possible only after the changes in the structure of the item, increasing the diversity of its response to random or nonrandom variables in such a way that allowed them to maintain the system in equilibrium. We then have to deal with the ultra-stability.

Measurement algorithm allows the identification of measuring the level of development functioning of the objects. That is the evaluation of the operation according to the set of parameters values of any variables within the function of the objects. Everything is based on the action of negative feedback (deviation). Disruption giving rise to cause disturbances in the balance as a function of the operation level for the object possess "positive stability" to return to the state of "Stable Equilibrium". It means effective responses towards maintaining or returning to equilibrium.

Measurement algorithm for the state of a "stable equilibrium level of development of the functioning of object" and evaluation of the possess of its operation may be either parametric or structural.

3.2. Application of Multicriteria and Multidimesional to analysis the Object's State

3.2.1. Examples of selected some method in resolved the problems in this dissertation

1. Multi-criteria analysis - Bellinger's algorithm (12)

Data according to a multi-criteria analysis - in the most general brief, it is possible to make such a decision by means of an appropriate criterion, according to which one could evaluate and compare the effects of making one or another decision. Having such a criterion, it is possible to determine which decision is the best decision. The evaluation according to the multicriteria analysis consists in bringing the results of the evaluation using various partial criteria to additivity of the partial assessments, so the assessment is made by more than one crite The simple situation is when one should make a decision based on one requirement, one size, one criterion. Therefore, there is no problem when the cheapest solution should be chosen, eg when several suppliers offer the same construction service at different prices. The situation is more complicated if the services are not the same, when they differ in quality, location, compliance with health and safety conditions, and the aesthetics of the executed object. Then it becomes necessary to conduct a multi-criteria assessment.

Knowledge of the principles of multi-criteria assessment is necessary when making decisions as part of an enterprise restructuring action, when, for example, a decision should be made regarding the starting of a new production.
The multi-criteria assessment methods are varied in their assemblies and differ significantly in the calculation mechanism.

This differentiation is understandable if one takes into account that these methods differ in the purpose they are to serve [35]

The BELLINGER algorithm consists in bringing the results of the evaluation using various partial criteria to the additivity state and on specifying the overall assessment as the sum of the partial grades.

Adaptation to the additivity state is possible by determining for each partial criterion two states: the least desired state and the most desirable state, and then on the expression of each number resulting from the measurement with a given partial criterion in a fraction of the path from the least desirable state to the most desired. The total assessment is obtained from the sum of the percentage of completed roads in all partial criteria.

2. Wrocław Taxonomy[13]

Taxonomy is a branch of mathematical science devoted to the principles of ordering and classification. The name taxonomy comes from two Greek words: taxis - arrangement, order and nomesis - law, principle. There is a special place here for methods dealing with the evaluation and classification of objects described by features that can be presented in numerical form. As the main goals of taxonomic methods, one can mention here:

1. organizing the sets of objects due to a certain set of features describing these objects,
2. unfolding the set of objects into parts (subsets),
3. organizing a set of features describing objects due to the collection of the examined objects.
Wrocław taxonomy (otherwise known as the dendrite method) is one of the methods of detecting the proximity (proximity) of objects, and therefore their similarities due to many features.

The Wrocław taxonomy method allows for the transition from a multidimensional space to a plane by means of the construction of a matrix of distances between each pair of multidimensional objects and the construction of a dendrite in which relations of multidimensional objects are reflected.

The Wroclaw taxonomy finds the optimal dendrite, it is the dendrite, which gives the minimum sum of distances between objects, calculated according to individual sections (ligaments) of the dendrite. Dendryt should be consistent. This property is preserved when between two objects (whose numbers are inscribed in circles) there is a road consisting of sections connecting these objects. These paths (distances) cannot be closed, hence the name of the dendrite.

The length of the dendrite is called the sum of the length of all its sides. For a given set of points (objects), you can usually present many dendrite arrangements (hereinafter

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[13] The creators of the Wrocław taxonomy are K. Florek, J. Łukasiewicz, J. Perkal, H. Steinhaus and S. Zubrzycki, who in the 1950s created the General Group of Applications of the National Mathematical Institute in Wrocław

referred to as dendrites). Of the two different dendrites, the one whose length is smaller is better. Similarly, the one with the smallest length is the best of many dendrites [18].

3. Steinhaus Method

1. In the Hugo Steinhaus method, the criterion of the range of points to particular subsets is the distance, and strictly the square of the distance of a given point from the local center. This distance is calculated based on the Pythagorean theorem.

2. Also in this method there is no formulated division criterion, which is a disadvantage in the decision making process.

4. The Hellwig Hellwig's division - Economic Development Pattern EDP

1. In the Hellwig method, find the optimal dendrite, i.e. the dendrite, which minimizes the sum of the distances between the objects. The resulting dendrite is a coherent dendrite.

2. After receiving a coherent dendrite, we construct an abstract development point, which obtains the most points in the range from 0 to 1 as the value of development from points obtained from diagnostic variables, as the pattern of economic development - EDP (WRG[14]).

We introduce the measure of economic development - MRG as the distance of each point from the point of development pattern.

3.3. FAM Transposition for the purpose of the New Method "MBF"

3.3.1. Guidelines to establish a FAM's research

All problems concerning the collection and gathering reliable and comparable statistical data has been pushed aside because of work the main objective that is to achieve results through a methodology of finding a useful and effective tool for measuring and evaluating the stability of the objects in this research.

The scope of the problem of measurement the level of development of objects or phenomenon towards the primary objective of the trial is an attempt to achieve methodological results by answering the following questions:

1st How to choose or to design the pattern model of development to be used for studying the problem of development level ?

2nd How to determine the most important, most convenient and most relevant technical, economic, political, social or other factors which has influence on the stability of objects or systems?

3rd How to measure the relative differences and similarities between objects and the degree grade of influence on the stability ?

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[14] In pollish it is (**Wzorca Rozwoju Gospodarczego WRG)**

4th How to split (classification), the set of all objects in a groups of objects that are very similar, and some show a difference?

5th How to quantify the indexes values of similarities and for the grade level of objects as an indicators of the development level?

In resolving these problems theoretically and practically as fundamental assumptions problematic, FAM offers tools that could help provide an answer to the questions posed above.

New tools to measure and to evaluate the uniformity of the level of development could replace the regression analysis, correlation analysis, analysis of variance and factor analysis.

The new tool is more appropriate from a theoretical point of view and easier accounting.

3.3.2. Guidelines for FAM Model Construction

To formulate the FAM model successfully, the researcher (decision maker) must:

1. Understand the problem

2. Identify the decision variables:

- the causal features.
- the measurement units, such as kg, temperature etc.
- acceptance of the intervals of changes of features and trends.
- importance of the features.
- determination of real values of features.
- determination of the worst and best values of features.

3. Choose a numerical measure of effectiveness for the item, according to the valid standard.

4. Collect data or make appropriate estimations for all parameters of the model.

Besides this, there is a basic assumption, which constitutes a starting point for building your model and to be connected to Computerized FAM Model - CFM.

The chosen variables (CV) present the decisive features of the degree level of development and the conditional factors for their values.

Then according to the examined hypothesis, we test the level of development of the population with regards to the chosen variables to examine Cause-and-Effect relationships and interaction between features, and factors. Figures 3-1 and Figure 3-2 presents the CFM flow chart to be used for the proposal system. The results of testing the population can be presented in the form of points or a numeral given to the individual of the population.

3.3.3. The difference between FAM and other methods

The PhD and habilitation theses, which have been hitherto supported on the basis of the Bellinger, Steinhaus, Hellwig, and Obłoczek algorithms, have been verified in practice. In the course of further research work, some new problems appeared, requiring further improvements. There is a need to enrich the arsenal of monitoring tools and internal (zone in) and external (zone out) assessment of the environment, taking into account an objective assessment of the level of development of the facilities.

The procedure of selecting diagnostic parameters (variables) and interpreting the evaluation results were also changed for the needs of the FAM algorithm. These include issues such as:

1. The Steinhaus algorithm has the ability to divide the population into subgroups, limiting itself to stating that the given object belongs to a given subgroup.
2. In the cloud method, using the Steinhaus algorithm, the computer counts within each combination the variance for each subset.
3. The most densely subset subset, that is the subset of the smallest variance, whereas the least concentrated is the subset of the greater variance.
4. After finding a combination in which subsets of the smallest variance are present, the computer performs a multi-criteria evaluation for Bellinger's multi-criterial methods.

5. The Steinhaus method is applied as accurately as possible in cases where there is no formulated division criterion (if we want to divide where there is no interval criterion).
6. Bellinger's algorithm should be included in the so-called sums of standardized linear ordering of objects with subjectively declared number of features, ranges of their variability (oscillations) and their meanings (weights).
7. The way of specifying in the Bellinger's algorithm the optimum of individual features on the basis of determining the division of values considered optimal has been changed in the FAM procedure

8. The selection of hypothetical variables (stimulants and destimulants) for each criterion does not have to be linear (as currently assumed by the Bellinger algorithm) [43].
9. Dendrites according to the Hellwig method are not only supposed to inform which subgroup the given object belongs to, but also what is the relationship between these objects.

10. The characteristic selection of factors (as explanatory variables) and determining features (as dependent variables) is very useful in the assessment and analysis of clusters of various configurations of diagnostic parameters (explanatory and dependent variables). Such analysis will replace the term "computer game" used sometimes to describe the interpretation of huge images of clusters.

3.3.4. Evaluation of the level of development of objects according to FAM

The Fail Assessment Method FAM means the Fall Evaluation Method. It aims to comprehensively assess the deteriorating physical condition, level or activity of objects while performing their tasks (work) under specific conditions. It is a research tool for

continuous monitoring of the facility's operations in order to detect, explain and prevent deteriorating levels of development. It is used to solve practical problems directly in the place where they occur, i.e. to assess the level of the existing state.

The FAM method included such as the Multidimensional Comparative Analysis - MCA types of tasks:

- Division of the set of objects into subsets, i.e. classification,

- Evaluation of objects, that is, line ordering of objects.

The specificity of these two tasks is that the classification leads to the division of a set of objects into subsets called classes, objects more similar to each other due to certain properties, and linear ordering leads to the hierarchization of objects due to the intensity of values describing these variables, therefore FAM talks about researching the development of objects.

In the FAM method, grouping objects and placing objects with more closely related values describing them in one group was called "similarity of level".

Is it really reach the "high level of similarity" is the main goal or only the operative goal of grouping?

There is no doubt that the main purpose of grouping is:

- Extracting subsets of objects with a specific set of variables,

- And about specific relations between variable.

Only the implementation of this goal makes grouping useful for practical purposes, eg management, programming, forecasting, etc. (an example of a transport algorithm and an example of grouping a farm).

Hence the question arises whether the FAM method based on the "similarities of the level" and the "level of development" realizes the main purpose of grouping? The answer is - YES.

It is worth adding that up to now, in empirical research with the help of FAM, the main goal of grouping as the basis for the division of objects due to the level of variables and the relations between variables has been achieved in the scientific works done for these times.

Multidimensional assessment and confrontation The results of imaging examinations Evaluation criteria

1. Characteristic features – decisive Criteria determining the assessment of patients in terms of the level, quality of health , differentiates patients in clinical terms due to their

level of health (before and after treatment), but they do not decide on their level of health during treatment.

2.Factors-qualifying On the other hand, patients with regard to obtaining health levels in clinical terms (before and after treatment) may be characterized by differentiated assessment (status indicators) due to the level of health in the therapeutic aspect.

3.4. FAM Rationalization for assessing the failure with MBF

3.4.1. "Organizational Development Level" as synonymous with "Quality"

Currently, a modern company wanting to achieve and maintain a competitive position on the market must ensure an appropriate level of quality of the products it produces. However, quality - in addition to production efficiency and costs - is increasingly becoming a decisive element in the company's duration and development. Achieving the desirable quality of products requires the application of appropriate product design, selection of materials and raw materials and their proper control, within the qualifications of employees authorized to control all processes of manufacturing products inside the company, as well as related to their external distribution (market).

In combination of the problem of quality and the quality of the development level in companies, it raises some questions of nature, what is the quality and what is the organizational development's quality?

- is it possible to assess the quality of organizational development?

- Hence by which measures we need to an assessment?

- is there is any basic definition or classification of the organizational development according to establish any standards?

In general, the concept and definitions of the quality is contractual. These definitions differ significantly and are determined in various ways by the researchers of the quality issue.

In my opinion the quality of organizational development acts indirectly on the level of development of the company.

The Concept of measuring „quality of organizational development in the company" in the proposal method MBF is nothing other, than the "level or degree of development". The method of MBF aspires to use quantitative and qualitative interpretation instead of the qualities signs Q by the index of estimation the level of development EA for each company (see fig. 3.3 as the algorithm's base for the proposal systems).
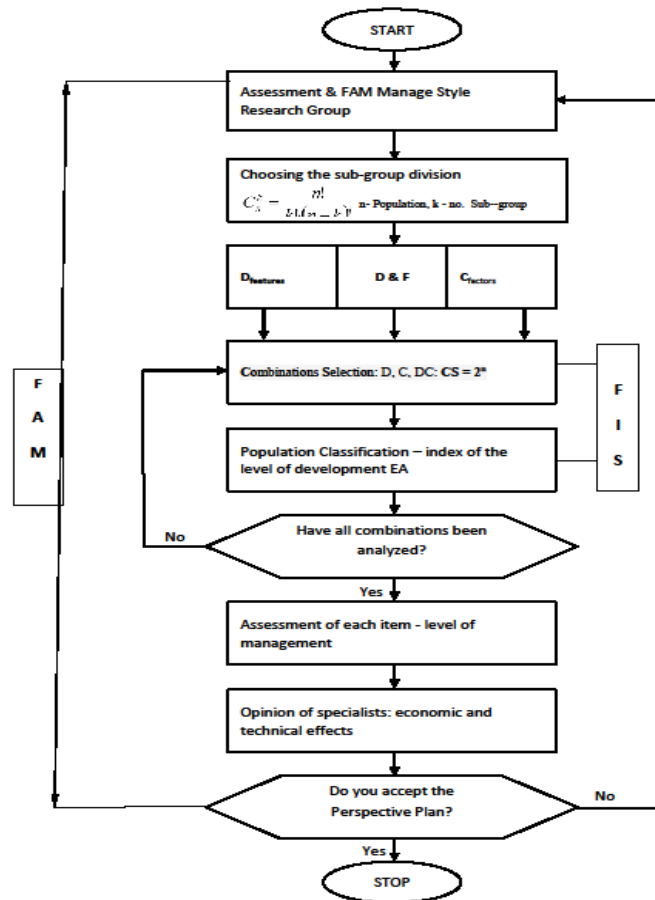
Fig. 3.3. FAM- Method Style & Fail Information System - FIS
The block diagram of the MBF Style
Source: Own study basing on FAM

3.4.2. Degree of development EA

By studying the principle of FAM method I found out a particular measurement for assessing the stability of *development level* in a company. The new measurement denoted with the sign EA as underline degree of the development. The measurements of the development includes in its extent of assessing in time and space the indicator of performance EA_p in the company and the index of similarity EA_s to show the relative level of similarity development level compared with that of a previous date or in another company.

In general, the degree of development level is a useful measurement tool to provide the manager with specific information about the performance in the company basing on so called features of functionality, and on the other side on so called factors of efficiency

about the level of development or state of development and to warn before the fail occurs.

3.4.3. Implementation of COC-MBF

The COC system is used to assess the current (TN) level of a company level of development in achieving the set goals. This system supports the decision making process and enables the researcher to manage the development level of M3$_{exp.}$ during the productivity in Time Now as an event of supplying to satisfy the Market Demand by using *Management Protection against Failure – MPF*.   All this should be done through the prism of cause and effect in deviating from the desired level of development by means of assessing according to the obtained qualification classes
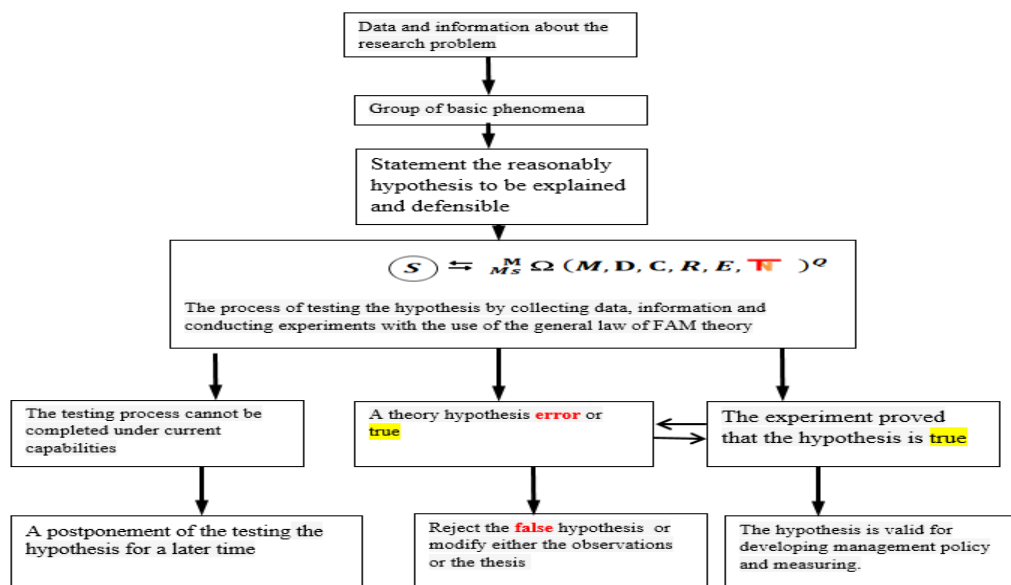
Fig. 3.4. Implementation of COC-MBF (basing on S Procedure)

The Formula of $\left(\,S\,\right)$ **- Simultaneous experimentation"**

The principle of the "**S –Simultaneous experimentation**" (fig.3.4, 3.5) which contains in the **Fail Assessment Method** is a mathematical tool to fix the **Fail** of "Developing Product" level in Time Now:

$$\left(S\right) \leftrightarrows {}_{Ms_{\square}}^{M}\Omega\,(M, D, C, R, E, \mathbb{N}\,)^{Q}$$

Where:

$\left(S\right)$ – System of evaluation S- refers to <u>Simultaneous[1] experimentation</u> (application of the system with practical confirmation & decision making as follow:

M – The population included in the experiment,

M_s – Observations (sample) from the population,

R – A set of interdependencies between oil parameters (features),

D - Decisive features- denote the level of development

C- Conditional factors- denote the similarity level

E – Goals and economic effects (cost-effectiveness of costs of performance of the task),

N - This symbol refers to Time Now in the experiment as today's date of an event or activity   to run the experiment and to choose the duration of the activities and settle the node,

Q – Fulfillment of the task, i.e. optimal, quality of the obtained results- decision making that is a balanced decision to be reached after comparing all arguments by choosing DF & CF (according to the flowchart – input -process –output),

Ω - Mapping sign, i.e. experimental test and the application of the system in the same time and task execution according to the proposed algorithm

Fig. 3.5. The principle of the "S –Simultaneous experimentation" (source FAM)
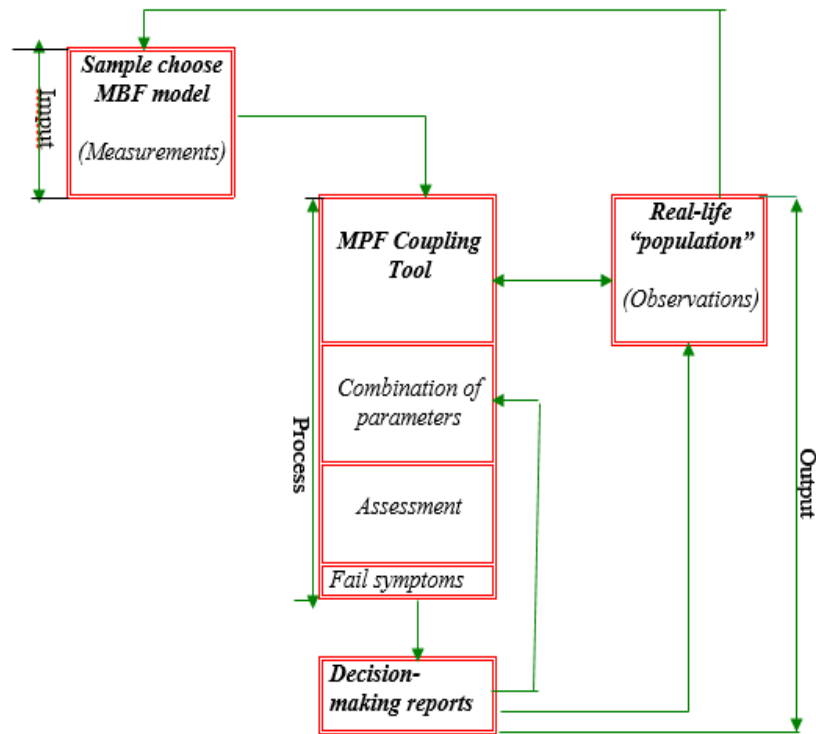
Fig 3.6. The coupling tool as the processing-decision (source FAM)

The MBF's supporting system (coupling tool –Fig.3.6) to measure, assess and manage the observations in Time Now for the chosen doses, and for looking forward to improve the doses to correct the action in TN. This creates a new situation in the issues to ensure proper remedial action before the complete "fail". This new opportunity to compete with conventional testing methods of effectiveness of medicine and creates new opportunities to apply modern techniques of control level 0of health in the current time, with a direct computer-assisted. An important issue is the simplicity and ease of use in practice the concept of statistics and multivariate analysis, which are cumbersome in traditional systems. Anyone possessing basic knowledge in this field can easily apply this method to his problem.

Therefore the control with "FAM-MPF" provides opportunities for continuous detection the level of health with a new medicine.

Making decisions basing on the S model[15]

The main problem in constructing the general S model is the choice of concepts for the management of the level of development and the system of evaluation and management of deviations. The general system for assessing the level of development in a given field or discipline is too complex to be made on the basis of a single criterion or management level of development. For example, in the proposed system of awarding a tender based only on price, this is not the best choice. Hence the ratings according to MBC based on the simultaneous model S relating to the selection of commercial offers is used to confirm the purpose of using diagnostic variables, to check them and confirm them by practical activities carried out in reality (TN) by means of empirical experiments. It is also supposed to fulfill the informative function for economists, engineers and decision makers needed by them in the normative scope, where the benchmark for comparing the results of the assessment in the S model is the determination of the degree of the level in the established plan and in the TN. The use of the original FAM method in the book to assess the state of functioning of objects based on the S model differs from the multivariate methods used so far in the following way: 1.Traditional systems controlled by data and scientific knowledge consist of rigid elements to modify and enrich the updated knowledge, while the FAM method gives the opportunity to enrich our knowledge with new phenomena regarding the quality of functioning of objects on the basis of the provided data of combinatorial features, 2.in traditional systems, scientific knowledge is incorporated in the process of creating an algorithm, while in the FAM method, additional new information can be obtained as a result of combining two algorithms (Stainhaus and Bellinger), 3.It provides new tools supporting traditional methods of quality control by applying the measurement results of Steinhaus and Bellinger algorithms, 4. enables early diagnosis of the deteriorating condition of facilities, 5.It is a new proposal for monitoring operational parameters and supporting information, enabling proper planning and control of the operation of facilities, 6. enables the use of simplified statistical calculations and multivariate analysis, 7.allows you to present the test result in the form of images and charts, which greatly facilitates their analysis and drawing conclusions, 8.It is an effective method to study new phenomena in order to establish standards for performance 9. allows you to correct the existing scientific knowledge regarding the quality control of objects. 10. Management in the decision-making process based on the simultaneous model S is an innovative form of research aimed at applying new principles and approaches to measuring, assessing and managing the level of development, as in the case of exact and natural sciences.

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[15] See the book 1. "Management towards Protection against Failure –MPF, pages 41-51" and "zarządzanie Procesem Podejmowania Decyzji w oparciu o Model Symultaniczny- S – pages25-28"

The proposal of implementation the "**S** –Model in assessing the M3 is used as a tool to evaluate the deviation's level of the DP according to the obtained results with DSD & COC systems as shown in figure 3.7.

The Formula of (S)–Simultaneous experimentation"

$$(S) \leftrightarrows {}^{Ma}_{Mc} \Omega \left(M, D, C, R, E, \mathbf{T} \right)^{Q}$$

Where:

(S) – System of evaluation S- refers to Simultaneous[3] experimentation

M_a – Evaluation of management in action indicated by the MBF program (20 ⟶ companies)

M – A set of 4 oils companies (NOC) included in the experiment,

M_c – The current DP of a company in TN in a set of 20 companies ⟵

R – A set of interdependencies between CV,

D - Decisive features,

C- Conditional factors,

E – Goals and economic effects (prices-effectiveness of costs of performance of the tasks),

T - refers as Time Now, the period of running the system.

Q – Fulfillment of the task, i.e. the evaluation the quality of management,

Ω - Mapping sign, i.e. properties of the rating system and task execution according to the proposed algorithm.

Fig. 3.7. Making decisions basing on the S model

3.4.4. The diagram of the MBF-DSD system- Degree of Development EA

In the proposal Method - MBF a particular unit of measurement the extent of range of the level of development of a company in both time and spatial was constructed and denoted with the symbol EA. This measurement used for assessing the stability of *development level* in a company (fig.3.8)> The new measurement denoted with the sign EA as degree of the development. We must take in concern that, the measurements of the development includes in its extent the assessing in time and space two other measurement that are the indicator of performance EA_p in the company and the index of similarity EA_s to show the relative level of similarity development level compared with that of a previous date or in another company.
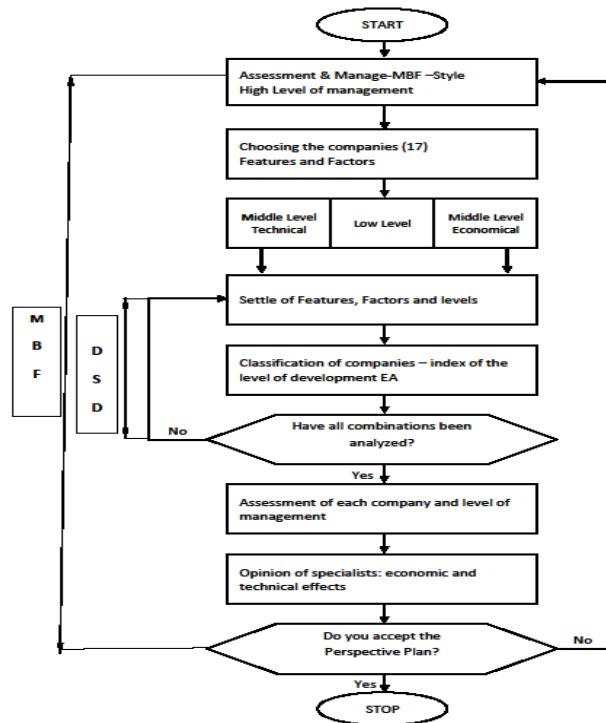
Fig 3-8 MBF- Method Style &System Detecting
The block diagram of the MBF Style
Source: Own study basing on FAM

3.4.5. Presentation of the Petrochemical Companies

The petrochemical company (fig. 3.9) in Libya is an institution consisting of four companies related to each other in this way, which allows them to achieve the most important goal, i.e. extraction, transport, processing and export of crude oil as follow:

C1 - Oil Well - extraction of oil,

 C2 - Oil Pipe transportation,

 C3 - Refinery- a factory where the petrol is refined,
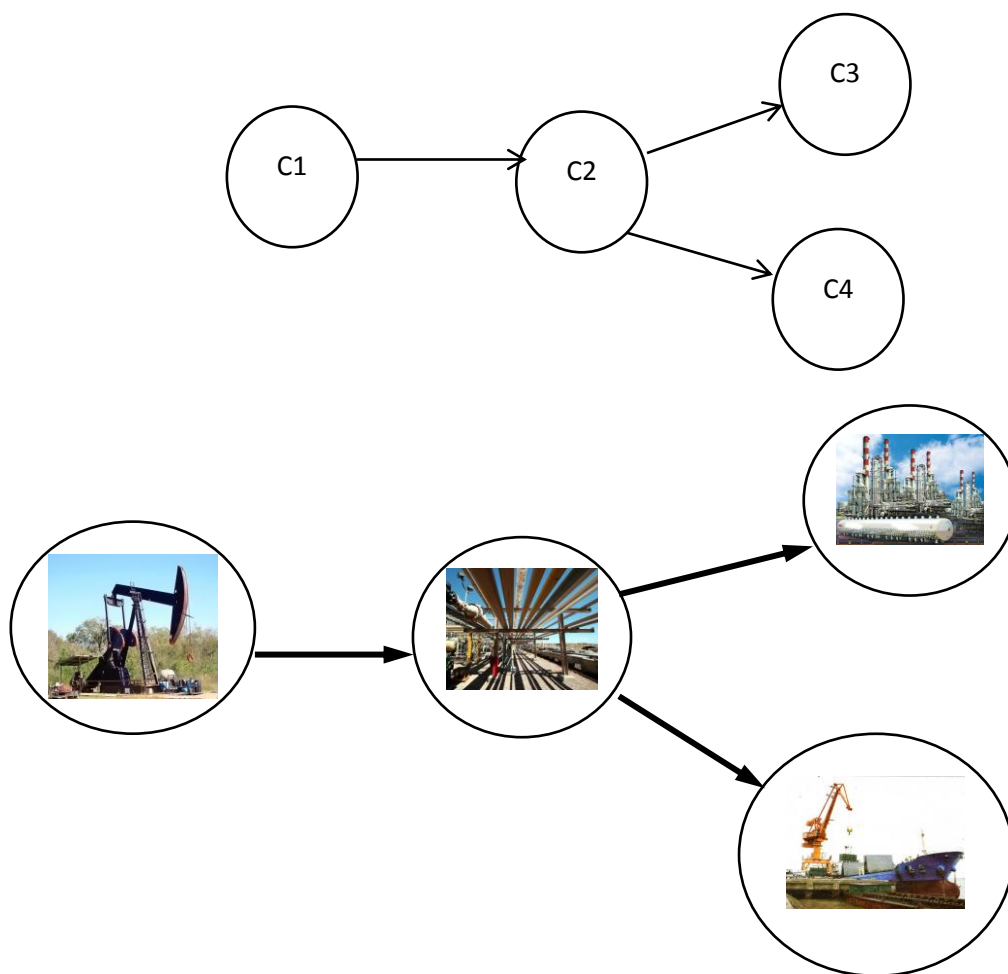
C4 - NOC (National Oil Corporation), presents central supervision over the all firms that are part of the NOC.

The role and the importance of the oil industry in Libya's economy results from the role of oil as a basic and usable source of national income . The oil industry as an important branch of industry includes the extraction of oil by the company (C1) transport by

pipelines through the company (C2), distillation by the company (C3) and export of the oil by the company (C4).

The hierarchical nature of the export system, under which a responsible is the company C4 within the corporation (NOC), has a special impact on the efficiency of oil exports. The export dependence is, therefore, the result of the activities of both oil extraction and pipeline transport for export.

That is why I devoted this to my doctorate to propose a working system of controlling the extraction the oil within the scope of offering a Central Supervision Management system to assess and managing each company of the National Oil Corporation.

Figs 3.9. Presents the dependence of export on the extraction amount of oil

Source: Own study

The aim of the work is to **assess and manage** the activities of each company through the application the concept of the Management By Fail which is based on two mains elements:

1. The Structural Element -**SE** that is organizing clearly defined divisions, department sections in which individuals can function with maximum effectiveness.

2. Human Element-**HE** which consists of good administration and supervision in every area and between areas as provided by various levels of management.

The procedure of MBF based on the 7Ms which distinguish the companies to recognize the difference between the companies' activities. Beside this, in the MBF we can assess the functionality of each company on the basis of the functional activities of the given company in the chosen period.

3.5. Application the theory procedure of MBF-DSD-COC to practical use

3.5.1. Deduction and deduction of the MBF procedure

This point is the last one in chapter three and is the fundamental beginning of the practical implementation of the proposed MBF method in the next chapter. The deduction and induction here means introducing a logical conclusions depends on the theoretical application of the FAM theory and a set of past circumstance's researches that had been applied in practice.

The balance pyramid in FAM is to monitor the State of Stability (SS) level of development of the objects in real time TN. Indicates the directions of actions of elements, which force the deviation depending on the value of the relationship between achievement of the level development in a chosen period and to use the chosen variables such like features or factors to assess the level of development taken in concern the same parameters that is from the ex post period time to manage the failure. However, after transforming the variables DE stimulating into variables stimulating the level of development and taking into account the surrounding situation of the company in the analyzed period.

3.5.2. Pyramid of stable for multi-resource structure

Broadly speaking the FAM method has been applied to solve many practical problems, using a different approach of dealing with the problem according to its nature. This method deals with a thing that according its functionality and dynamic produces actions or effects, that is to be assessed and managed during its functioning. The 7Ms presents the dynamic and with the functionality produce the actions or the effects. It is like a chassis of lorry without the engine which gives the dynamic the lorry can't able to transport goods and that is unable to do its function (fig 3.10).
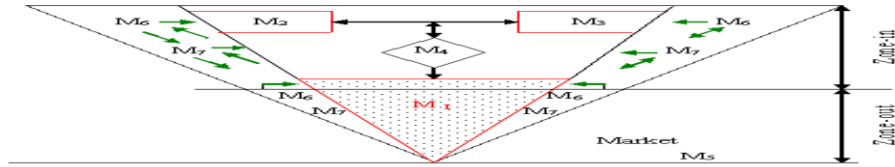
Fig. 3.10. Pictorial of FAM pyramid

Main symbol of 7M's in FAM origin

- Legend:
- M1– Manufactured goods, (products)
- M2 – Material
- M3 – Machines
- M4 – Man
- M5 – Market
- M6 – Money
- M7 – Managerial information

In short, most general equilibrium indicates the proposed pyramid to show the deviation , then the role of decision maker in the initial phase of the evaluation of individual components, in accordance with chosen the parameters of the stable to gain high level of stability (see Figure 1.5).

Experimental nature of the pyramid is to manage the balance by using the DSD system and to enrichment capabilities of current knowledge about the level of development. This is done by comparing the state with the period of the ex post level of the system, enriched by a technique of pattern recognition (deviation - pyramid) (see Figure 1.5).

3.5.3.The conception of the "coupling tool" for empirical experiments

The conception of the "coupling tool" is nothing than a complex set for empirical experiments (fig.3.11).

The complex set of empirical experiments in interpretation of the "Fail Assessment Method - FAM" consists of five elements (**1, 3, 5, 7, 9**). See figure 1. These elements are designed and combined to achieve the settled goals in the research.

The elements of this set formally are treated as a certain mechanical system, serving as the project of empirical experiments for the purpose of the evaluation the level of

development of objects with the help of so-called Computerized FAM System - CFS of the "coupling tool". That is to say a tool in action under the name Computerized Fail Assessment -CFA. The role of CFA is to assess the level of development of objects as it is in the "project system CFS-CFA" for evaluation and to be denote a symbol of "**5**".

3.5.4. Synergistic "coupling tool operation" with MBF-DSD

The synergistic "coupling tool operation" is used with the MBF-DSD algorithm for a scientific objectivity of the theory in a pragmatic way.
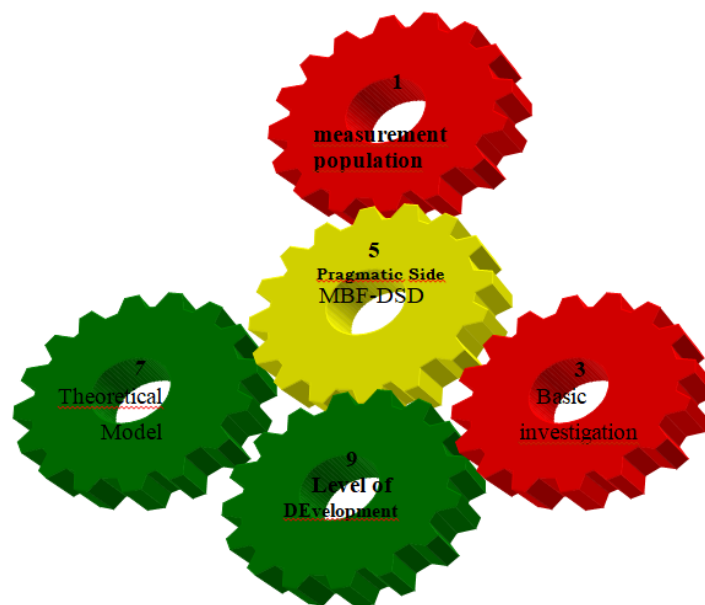
Fig. 3.11. Synergistic coupling tool with MBF-DSD

source: Own study basing on FAM

The synergy is achieved by combining the several elements as below:

1- Refers to the characteristic of the population.

3 - Refers to the settled goals by the decision maker in TN,

5- The pragmatic side MBF-DSD,

7- The theoretical model "simultaneous experimentation",

9- Population level of development to be checked in TN.

The evaluation of the level of development as mentioned before is treated as certain mechanical system, of which the dynamic characterization is a consequence of the internal structure of cause and effect.

The assessment mechanism has a great importance in supporting outcomes of diagnoses and investigation and analyses. The obtained values of features of examined objects as a distinctive characteristic allow for the determination the grade level of development of objects in the given period.

3.5.5. The virtual reality of the coupling tool

The evaluation of the level of development is treated as certain mechanical system, of which the dynamic characterization is a consequence of the internal structure of cause and effect.

The assessment mechanism has a great importance in supporting outcomes of diagnoses and investigation and analyses. The obtained values of features of examined objects as a distinctive characteristic allow for the determination the grade level of development of objects in the given period.

The coupling tool presents a mental virtual reality of a gear mechanism. The proposed method MBF-DSD presents the image of this mechanism and looks like wheels with teeth, on their edges that revolve together to transmit the (operating goals -**3**) through and with the (system DSD - **5**) to the elements (**1**- population, **7**- formula S), to gain (indicators of the development level -**9**).

The assessment mechanism has a great importance in supporting outcomes of diagnoses and investigation and analyses. The obtained values of features of examined objects as a distinctive characteristic allow for the determination the grade level of development of objects in the given period.

The essence of the evaluation the empirical experiments for the level of development of objects begins from the project of empirical research to be taken by the synergetic team (adviser). The choice of the elements (measurements) of the population and the variables are a final measure enabling the objective estimation of the planned aim. The synergetic team responsible for the project of evaluations determines conditions which a designed method MBF-DSD-COC of evaluations should fulfill.

The synergetic team possesses not only the knowledge of the methods of estimation and the classification of objects, but also establishes the adequate, measures of evaluation describing the choice of population. Also establishes the set of decisive features that decide the receipt of certain consequences (level of development) obtainment due to the applied factors.

The contemporary decision-maker, i.e. the scientist, being responsible for an evaluation of objects development, should be based in the choice of the evaluation system on two types of information - theoretical and empirical.

The construction of the mathematical model cover the basic concepts of evaluation the level of development in all the spheres of the company. The constructed model using the "S system Rule" provides a background to help the decision maker to understand the idea of testing the level of the development in the chosen period.

The goal of the evaluation is to exam the dynamics that produces or effects to the level of the development leaning on the criteria of the assessment of development in the real time which described by the variables features set.

The proposal method MBF is a dynamic method that verifies each element of the set separately. And at the same time the whole collection together. In addition, the data resulting from it can be confronted with reality. The credibility of MBF lies in that, the conclusions are consistent with the existing knowledge and to be confirmed with the current knowledge. Of course, the results of the research, based on a large collection, can help to the decision maker to correct his knowledge, and this will be the task of chapter four.

III. PRACTICAL PART – implementation
CHAPTER FOUR

MANAGING A SUSTAINABLE TECHNICAL AND ECONOMIC LEVELS

4.1. The role of MBF; MBC: MPF; as tools in managing the Failures

In advance it is better to add that the Method "FAM" was created in order to equate the importance of measuring and assessing the level of development, functionality and the balance of object's work or phenomena's stable in the real world. The assess means to estimate the quality or value of objects in several areas of knowledge, fields of science and art, and scientific disciplines.

The irregularities simultaneously in those areas create a feedback system of actions in which each of the irregularities may be the cause and effect of others. From here the all the presented here conceptions (MBF,MBC,MPF) are to be connected with the Network of Management's Functions –NMF.

To say that MBF applied in this dissertation is a new style of business management, and here a lot of questions arise, such like what is the difference between MBF and MBE or MBO?

No doubt, that MBE is a style of business management. It focuses on identifying and handling cases that deviate from the standard, recommended as best practice by the project. The advantages of the MBE are that problem of identification the exceptions are identified soon rather than after and managers are able to use their time and energy to eliminate the troubles. While the MBF gives the mangers the possibility to determine the requirements of **organizing** and the **directing** of its development by distinguishing each of the 7's M "resources" in the company within assessing the functional roles to keep the development of the company in Time Now (fig.4.1.).
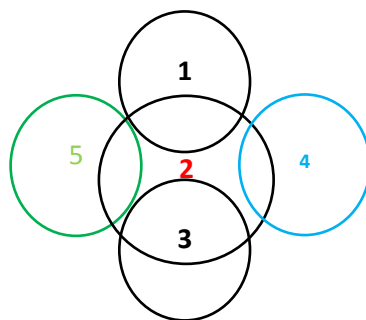

Fig 4.1. The relate between the manager the management's functions and control to realize good management (source: Own study)

Where: **1.** Planning   **2.**Directing **3.** Analyzing   4 Control   5. Organizing

4.2. **The purpose and tasks of the MBF method & the <u>MBC as a secondary</u>**

<u>conception</u>

In the proposed Management By Fail (MBF) method, the assessment of the level of stabilization of the organization level is possible due to the identification of the malfunctions in the functioning of petrochemical companies that hamper it in three areas:

1. organization of the management system,
2. organization of the technical system,
3. *<u>organization of the economic system.</u>*

In the sphere of in the stabilization of the organization level irregularities can result from a faulty approach to managing a petrochemical enterprise towards modernization and launching processes of continuous improvement of the oil extraction, transport and distribution methods.

In conscience concerning the sphere of technical system organization the incorrect is bad determination of activities and tasks of the intended project to improve mining methods in reality in accordance with the needs (from the incorrect construction and formulation of objectives and tasks in the production system).
Finally in the sphere of managing the economic level as a result of an incorrect assessment of organizational effectiveness (action) towards motivation, innovation to satisfy the need of the market which means a negative relationship between the effects of Organizing actions, Controlling and their outlays in the areas of efficiency or savings.

These irregularities simultaneously create a feedback system in which each of the abnormalities may be the cause and effect of others. This is the idea of the MBF-MBC-MPF conceptions to assess the state of stabilization of companies. The assessment of the actual state based on empirical materials (from previous years) and the author's experience on the one hand and the use of modern managerial techniques - on the other hand - allowed to diagnose and assess the stabilization of petrochemical companies in Libya.

<u>The MBF method is aimed at recognizing the "image" of stabilizing the "functioning" of the company based on the current level of development of the company's organization, which includes three components. While the MBC conception in this research treated as a secondary tool which later occurs as a supplement to assess the level of development from the point of view of various economic and financial relations within the CONTROLLING to assess finally the development level of the company.</u>

For example the procedure of choosing 3 Companies to apply a further Controlling Of <u>Economic level</u> taking in concern the <u>Technical Level side the decision maker ought to assess Economic side as a component of the level of development.</u> For this purpose we can choose and apply some additional Characteristics Values of the companies within the MBF system as follow :

Technical Level- with Features : (Level of Development)

1. M1 - level of oil - extraction [Barrels/month] = ($M1 \geq M2$) – Y01
2. M2 (M2 crude oil transportation) amount $M2 \geq M3_{exp.}$ [tons] Y02
3. M3 ($M3_{exp.}$ Amount for export [tons/month r] $M3 \leq M2$ – Y03
4. M4 working hours per employees (month) –Y04
5. M5 actually company supply of $M3_{exp.}$ - Y05
6. M6 signed contracts –gains from export $M3_{exp.}$ / Y06
7. M7 Managerial Intelig. Information [Reports account of the information] Y07

Economic Level Conditions : (Operational Benefit oil export with $M3_{exp.}$):

The product for export $M3_{exp.}$ In this study was settled as a "***Developing Level Product – DLP***", and was assigned the task of checking the Level of Development –DL.

Notice that, the $M3_{exp}$ form the main part of export as a Libyan's Monetary good to gain hard currency- & treated as a ***Developing Level Product – DLP.***

Definition :

The ***Developing Level Product – DLP*** is that the product which reach a high level of development with high number of quantity with highest quality standard from one side, and low costs of production and performance from the other side to satisfy the Demand of the Market.

Factors with Economic Conditions :

1. The M6 is a criterion of great capacity, to assess the impact of oil export quantity $M1_{expo.}$ $M3_{exp}$ on the Economic Level – with F01 OPEC Limitation stimulant.
2. The oil not exported quantity $M1_{n.expo.}$ reflects the value of lost as (F01 none stym..).
3. While the level of Costs for the manufacturer reflect the level of production and performance according to the taken actions.

Pattern of Development Indicators the scale of "Developing Product -DP"

obtained with FAM in a cluster of companies

Synthetic indicators in the Scale of Development present the "level of development" of a "Developing Product" as indicative to study the problem of Failure (fig.4.2).
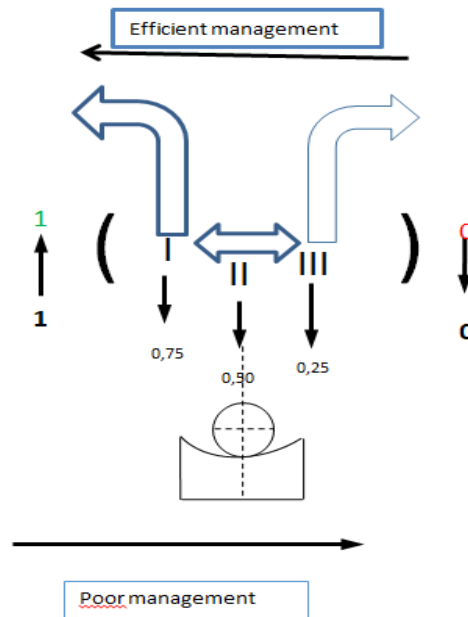

Fig.4.2. The scale of the Indicators of Ranking and Classification

the Developing Product (the position on the "Scale of Development Level"

basing on FAM)

All this should be done through the prism of cause and effect in deviating from the desired level of development by means of assessing according to the obtained qualification classes.

This creates a new situation in the issues to ensure proper managerial action before the complete "fail". This new opportunity to compete with conventional testing methods of effectiveness of the performance and creates new opportunities to apply modern techniques of control the level of development in the current time, with a direct computer-assisted.

An important issue is the simplicity and eases of use in practice the concept of statistics and multivariate analysis, which are cumbersome in traditional systems. Anyone possessing basic knowledge in this field can easily apply this method to his problem.

Therefore the control with "FAM-MPF" provides opportunities for continuous detection the organizing and controlling of the Technical and Economic levels of development.

Practical Confirmation- that is the further decisions according to the results obtained by the systems (influence under controlling) to change according to real situation.

This is refers to the levels of development both Technical and Economic, on the basis of the acceptable standards values.

These components are captured together and related to each other, they form the basis for stabilizing the level of organization. The MBF assessment is made on the basis of seven components, in the so-called "Pyramids of resources and products in the FAM method".

The management system component deals with the innovative issues in the field of dynamic approach to managing a petrochemical enterprise towards the orientation on modernization and launching processes of continuous improvement, improvement of the oil extraction method, transport and distribution.

The technical component consists in defining the activities and tasks of the intended project of improving mining methods in fact consistent with the assumptions of rationalism (i.e. needs).

The economic component is a necessity to strive for the economic development of the company, which means the cost-effectiveness of modernization in relation to the goals of oil extraction (see chapter 2.).

The problem of the organizational and technical level assessment includes comprehensive assessments of all three sides of the production process underway: management, production organization and work organization. A functional approach to this problem is used to assess all the activities necessary to achieve the company's goal. An important task is to determine the management of resources at each level of the hierarchical structure of management:

1. Higher level of management (High Level - HL)

2. Medium level of management (Medium Level - ML)

3. Level of sales (Executive Level - EL)

As part of these components in the doctoral thesis was introduced in order to clarify three issues in the field of economics and organization .

The first issue is problems and questions that can be answered by the chief accountant, that is, the economist in the enterprise "marked with the A code" (Figure 2.1).

The second issue is a group of questions that can be obtained from the chief engineer (code B).

However, when a difficult question arises and requires an immediate response and when they are the chief accountant, or the chief engineer can not give an answer - the director (code C) appears with his intuition and gives a response that may even be contrary to the suggestions and conditions of the economy. " classic ".

This is the order in which answers to difficult questions are graded, and the director, basing on acquired practical experience, has knowledge and intuition, justifies his answers using simple tools like the MBF-ALL method and system, which would provide quick information about changes in internal and external conditions of the company . Hence, the proposed evaluation system is of such importance and must be directly subordinated to the Chief Executive.

Executive Sales

The MBF method is aimed at recognizing the "image" of stabilizing the "functioning" of the company based on the current level of development of the company's organization in the three areas. [47]
Two systems have been designed within the MBF method:
1. System Management by Fail (DSD)
2. Crude Oil Companies (COC).
The calculation mechanism in these systems consists in the use of multidimensional analysis and multi-criteria analysis in assessing the existing organizational level of the company in Time NOW (TN). The results of the organizational status assessment are used in real-time management (TN) by identifying all (deviations) in relation to the established values or adopted standards, both those particularly good, as well as those clearly bad.
Thanks to these systems, the decision-maker can have a full picture on the current basis as to the progress of processes in the company.

4.3. The initial stages of assessing of the level of organizational development

The proposed application in the work of the MBF-DSD- COC systems is to monitor (on-line) the organizational status of the company and reveal symptoms indicating organizational inefficiencies. This is very important from the point of view of questioning the current organizational status in various conditions of the company's activity - in the aspect of early detection of the possibility of disturbing the functionality of the company.

Generally, using these systems, the decision maker will be able to assess the status (level) of organizational system development at any time and answer the questions whether the numerical values of indicators determined by experts require verification for various companies.

All calculations made by the computer program and the results of calculations depend on the content of information entered by the researcher or manager.

The results of calculations will be the basis for:
a) design and implementation of a new organizational and technical improvement plan,
b) verification of indicator sizes under 7-Ms.

c). the economic side
The evaluation and decision support procedure consists of these three phases, to be settled by the indicators of DL.

4.4. Practical implementation of the MBF method within evaluation systems

The MBF gives the manger more possibility to go further into the problem to diagnose the reason of the problem to be eliminate in the future by checking the relations between the features to correct the standard and to go through the Medium level to the Low level presented as a pictorial illustration of the pyramid where the HL manger seen in the structure as the higher level has the possibility even to investigate the Low Level through the IT specialist in the company as it shown in figure 4.3. 4.4.
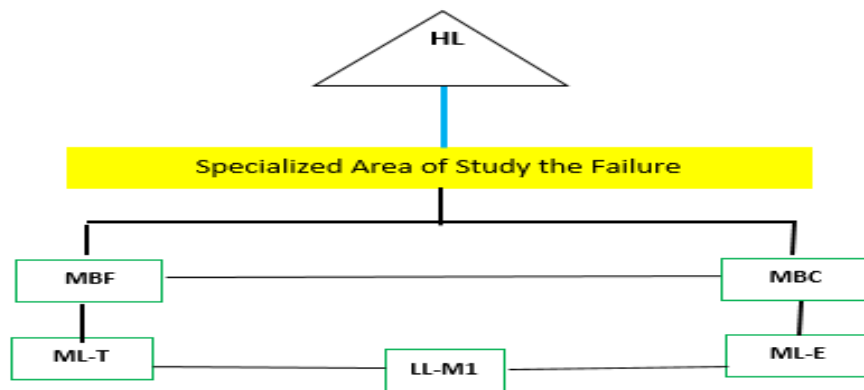

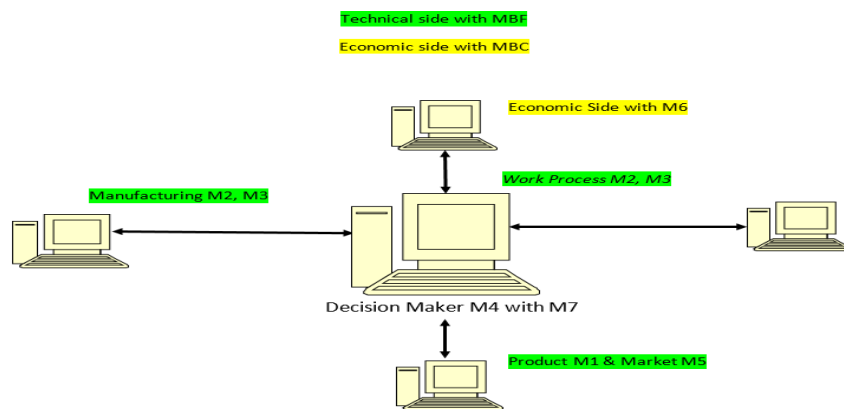**Fig.4.3. Investigations the problem of the Failure** (own study)

Fig 4.4. IT specialist section in the NOC company (proposed by the author)

Analyses the combinations of Characteristic Values within the MBF are a mixing of two main elements to be analyzed by separating them into the three parts:

1. Mathematical side- this element consists of the theoretical procedures, and intended for IT Specialist in the company,

2. **The structure of the MBF-DSD-COC package** - basis for evaluation in the model

3. The operating manual of the MBF-MBC-MPF

Beside this in the appendix the reader acquaints with many examples of using the DSD and COC systems for demonstration the goals of the research.

4.4.1. The mathematical side (Model – S)

The mathematical elements consists of the theoretical procedure , and is intended for the IT Specialists in the company.

In the mathematical side, the construction of application a new method MBF aims to settle, that the equivalent of measuring and assessing "the level of development" in the constructed theoretical model contained in the formula S- Simultaneous experimentation (see chapter 3), to enable the descriptions and the estimation the quality of the organization level eventually the economic level in the real world. The mathematical model is used as a tool to evaluate the deviation in organization basing on the current management in action.

The practical importance of the proposal MBF is to indicate the reasons and relationship btween the features and the factors influencing the level of development of the company during its performance. Also to ensure providing the information on the the level of organization development to decision making and enable the decision maker to go further into the internal and external situation in the company.

The constructed model MBF-DSD provides a background to help the manager to understand the idea of testing the development level (the quality) of the organiztion in the company (ex. Post)

For the author of this research the innovation of the proposed MBF-DSD of evaluation relies on the utilization a dynamic method to answer the questions settled in chapter three. Beside this the goals and the thesis settled in chapter two enables to exam the dynamics that produces or effects to the level of the developmen leaning on the criteria of the assessment of the organization development in the real time which described by the diagnostic features set while the level of the companies similarity calculated on the basis of the factors taking in concern the qualification classess A,B,C,and D.

For studying the **_Theoretical description of the MBF-DSD-COC_**, the reader should be familiar with the addition to this research in the appendix.

4.4.2. The structure of the package

General speaking to construct the model used in this research according to the MBF package" must meet three conditions:

1. **Specify the theoretical needs** (justification) and practical realities, to meet the model for the development level of organizational in NOC companies. The author of this work after observing the phenomenon in this research i settled the purpose of this research, the thesis and the action plan in the field of knowledge requirements for my research such as: Economics, management, multidimensional analysis and statistic. This knowledge needed for the specification variables according to the strict theoretical assumptions of the fields and to determine the form of an analytical model.

2. **Statistical data**- the constructed model is based on the obtained data (decisive features and conditional factors) from a trusting sources in Libya to secure;

-Data quality,

-The amount of data,

-The truth,

-And the completeness of the data.

3. **The algorithm and the procedure** - the assessment of the development of the population under diagnosis (17 companies of crude oil) using the new proposal MBF-DSD-COC . The data processing package in the proposal procedure ensures that the constructed *"model* " depending on the action of putting the information into the computer for processing (input data), treats the parameters of the population as a complex "structured" set, which gives on the output stream of information as a "*copy",* with the required accuracy to describe the behavior of the organization due to modeling of action of the past as "original" and under new condition in "time now- on line or off the line" and will describe the behavior of the organization level in the company model as the original for the new situation in time now.

The structure of the *processing-package* and evaluations is based on the MBF procedure. Therefore it is important to say that to play and build a "research model according to MBF" using the package (S) according to the following schema:

1. Determine the characteristics of decisive features and conditional factors of development,

2. Construct the all possible combinations of variables,

3. Determine all possible combinations M_y in the current situation as a final (last) event for a possible model,

4. Selection of the combination of Mz, it is the original as "preceding events of the past" where need to look for a copy as succeeding events in TN and that copy to open the model in the current economic- technical situations in the company.

5. To start building the model of action it is relied on by a REPLACEMENT PLAN of activities instead of (initial plan) and is suitable for the operation of the plan of change in the new situation.

Before the construction of events, it is advisable to prepare the model playback process as a written description of events so that the objectives were clearly defined.

The structure of the new model with different variables, enable to control the functioning of the company, and making assessments of the forces and direction of the impact of variables (features and factors), allows to know the structures of the organization's functioning, which allows the decision maker to manage its activities. Using a computer for calculations allows solving very large, complex and varying scientific problems. The research process in the dissertation will focus on solutions of the following issues:

1. A measure of the organization development level made on construction a synthetic degree of development EA_d, which replaces the description of this level in the company of the surveyed with a collection of valuable measurement of the performance, and the index EA_s of development measure-described by one value that is the index of the similarity of development.

2. The innovation is to develop the S rule for verification the current technical and economical standards "norm" to assess the permissible variations in the parameters describing the development of the stability of the organization system in the company.

3. Developed by me the new system does not fall within the scope of a new method from the scope of the statistics, but indicates the validity of the use of technical and economical characteristic.

4. assessment of the development of the population under diagnosis using the new method (conception) of MBF data processing package ensures that the constructed *"model* " depending on the action of putting the information into the computer for processing (input data) treats the organization level as a complex "structured" set, gives on the output stream of information "*copy",* with the required accuracy will describe the behavior of the performance due to modeling of action of the past as "original" and under new conditions in "time now-on line or off the line" and will describe the behavior of the level model as the original for the new situation.

5. Considering the MBF-DSD-COC, as an example of the assessment of the level of stability, based on a practical assessment of the organization level.

Practical application of the proposed method was supported by practical examples derived from practice, where the correction of organization level of development has been resolved on the basis of "measuring of development" " connected with the "empirical coupling tool of FAM".

4.4.3. The operating manual of the MBF-DSD-COC

The reader is kindly requested to see the attachments for further information about the evaluation and operation the two systems DSD and COC.

4.5. The MBF Method and Systems of maximum utility

The algorithm of the MBF gives the manager the possibility to assess the deviation according to so-called "Pyramid of balance" in the FAM procedure. This procedure gives the opportunity to assess the operation of elements affecting the stabilization of the level of development depending on the chosen characteristic (7Ms) as actions of measurements. The procedure of managing the level of development (deviation) is presented in figure 4-5.
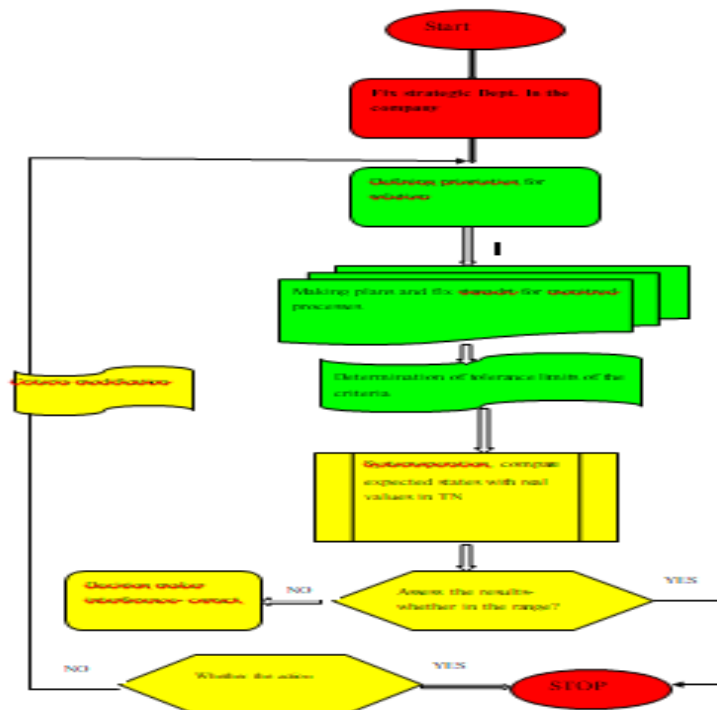

Fig 4-5. Scheme of activities during the procedure using of MBF method

Source: Own study

4.5.1. The operating manual of the MBF (Basing on MBE 56)

A microcomputer connected with a central computer located in the NOC secretary's office should be placed on the decision-maker's desk (High Level, Medium Level, Executive Level).

The decision maker begins his working day in Time Now from a review of the yesterday's situation at the nodal points of his company.

For this purpose, the decision-maker presses subsequent numbers of these nodal points on the microcomputer keyboard, receiving information on three different versions on the screen.

If the place requiring inspection is, for example, the operation of the P8 pump supplying the oil pipeline (eg at C2 - Oil Pipe), and the pump standstill is no more than 45 minutes in one shift, the decision-maker treats this as a correct situation.

Then, in the case of a 40-minute standstill, the first version of the image appears on the screen - see Figure. 4.6.
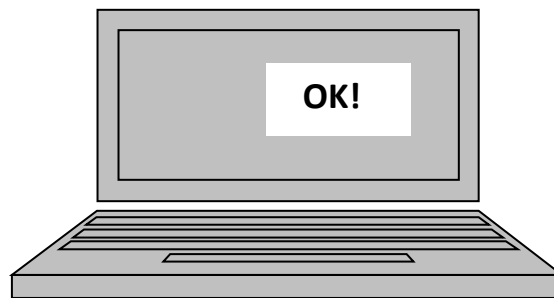
OK!

Fig 4.6. Information about the operation of the pump No. P8
Source: Own study

However, if on the last change on the previous day the pump stopped for 70 minutes, that is, it exceeded the permissible limit, the information in the second version appears on the screen - See Figure 4. 5

Overrun: 56 (55,55%)

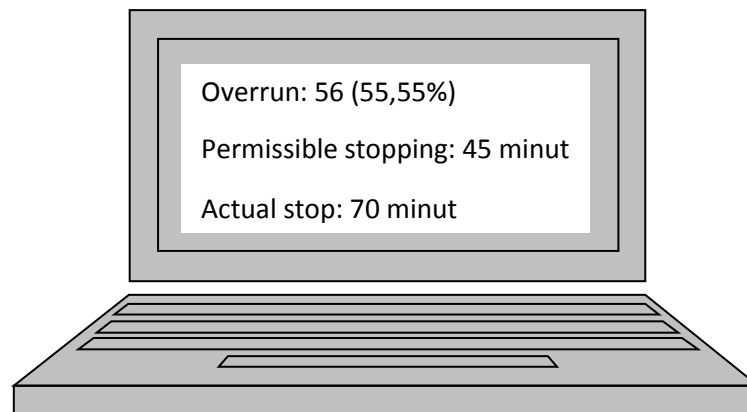Permissible stopping: 45 minut

Actual stop: 70 minut

Fig 4.7. Information about pump operation No . P8 - exceeding 56%
Source: Own study

After receiving the information in the second version, the decision-maker, pressing for the third time, can receive information in the next version, namely who is responsible for the operation of the pump No. P8.

It can be, for example, Eng. Hashem Ali - See Figure 4.8.

Responsible for the operation
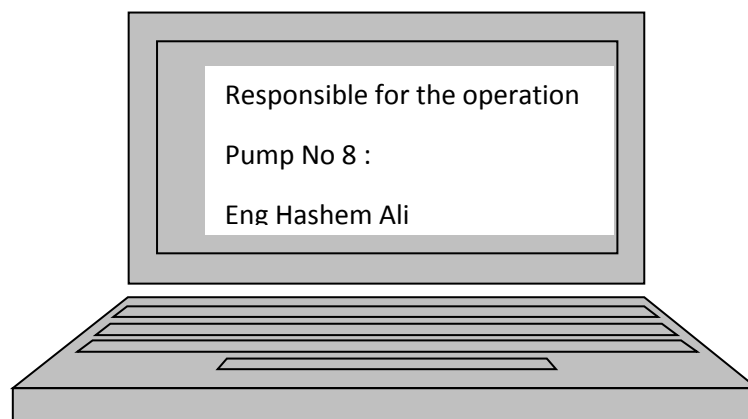
Pump No 8 :

Eng Hashem Ali

Fig 4.8. Pump change manager - Hashem Ali Omar
Source: Own study

Equipped with the mentioned information, the manager - depending on the explanations obtained, as to the presented state of affairs - may decide on further remedial steps: from the correcting instructions for incorrect work of the P8 pump to the release of the engineer responsible for his work, especially when the last one does not know what are the reasons for the bad state of affairs and how to remedy it.

As you can see, the MBF method is absolute but effective. Nevertheless, the introduction of MBF to organizational practice is a complex undertaking. The system of conduct in force in the activities using the method is presented in Fig. **4.5.2. Preparations involving the approach to utilize MBF for practical purpose can be summarized in the following seven steps:**

First step- indication of strategic places

It involves determining strategic places in the company. For this purpose, the decision-maker indicates several nodal places in the activities of his company. By exchanging these places, he consults with his deputies, his assistant and advisors, to finally identify

those places that can be called nodal places in the enterprise. There are, for example, ten such places in an enterprise

Step two - settlement of places in order of importance

The established strategic places should be ordered in order from the most important (dangerous) to the least important, determining the names of persons responsible for the situation in these places.

Step three - arrangement of places according to achievement

In agreement with the persons mentioned in the first step and based on the reporting data from the previous year, the lower and upper limits of the range in which the main numerical value characterizing the activity of a given place in the enterprise may fluctuate.

Step four - determination of permissible stop in operation

Determination of tolerance limits, the decision-maker determines that he / she will be interested in exceeding the lower and upper limits if the exceedances exceed by, for example, 20%.

Step five - display of data on the screen

In the company's IT center, an IT system is developed, selecting from the currently collected data bank - data necessary for the MBF-ALL system and the method of transmitting information to the decision maker's office, as well as the form of displayed images on the computer screen on his desk.

Step six - trial operation of the system.

At this point, the specificity of the MBF method should be clearly emphasized, namely, the discussed MBF-ALL system has a chance of success only if it can be implemented in a short time, at low costs. Hence the simplification.

As shown, the first four steps are based on consultations but nevertheless, the sense and intuition of the decision-maker are decisive here. The first four steps should be implemented, for example, within one week. The next week should be devoted to the development of the IT system (step five).

What can then turn out and what will most likely take place. Namely, it may turn out that all or most of the nodal sites are disrupted daily. However, it may also turn out that only a few or no places show no disturbance. Both situations, and therefore both extremely pessimistic and the extremely optimistic decision-maker will not be satisfied. And then it becomes current successive correction of the system.

Step seven - implementation and correction

It consists in the systematic correction of the findings made in the first five steps, so that the decision maker can be convinced that the lack of alarm signals indicates a really

correct situation and that he could focus his attention on those places of the enterprise that were the weakest points in the management process on the previous day.

As a result of these activities, it turns out that the daily reports should be subjected to a different set of strategic places (step one), that the order of importance of these places and the other team of employees should be entrusted with the responsibilities of managing these sections (second step). It may also prove that others should accept the limits of permissible fluctuations for numerical data, informing about the situation in these places or that they should be completely different figures (third step).

The decision maker can sharpen or mitigate the limit values on which reports on overruns should be submitted (step four). And finally, it may be necessary to change in the IT system itself, in the computer program, or in the message itself on the screen (step five).

After the period of correcting the entire system - the MBF-ALL system will most likely prove to be useful and efficient. Of course, under one condition: the decision-maker should be the director. He should have the authority to release and employ his subordinates in accordance with the assessment he made, without consulting local government or trade unions.

When undertaking work on the restructuring of enterprises or industries, it should be borne in mind that radical changes in management styles require a radical change in the culture of the organization and management systems. This means the need to make changes in the atmosphere and in the style of the company's work.

Management By Fail (through the study of deviations) as a managerial technique tool can be helpful. The company - as you know - is not a philanthropic organization. The heads of the cells, where the system of management by exception shows that their work is below the numerical values- they - must leave the organization.

4.5.2. The procedure of company evaluations based on systems

The aim of proposal MBF's working systems is to assess each companies of the National Oil Corporation in Libya in the periods 2014-2019, on the basis of characteristics distinguish the Level of Development of organization in each company. These characteristic are decisive features (features of productivity) that increase the stability of the level, and the conditional factors, that are affecting deviation and influential in reaching points of similarities of the organization level to be compared between companies in the chosen period.

The determinants of the level of development chosen in the system are:

1. **Resources that increase the stability level of development of organization basing on the 7 Ms.** These are the decisive features to measure for example among others features, the efficiency of the amount produced or sold in the same time.

2. **Factors of investigation the effectiveness of the levels of organization basing on 7F$_s$** (Management Level- to be denote HL , Technical Level- to be denote to ML_T and Economic Level - to be denote to ML_E), and to be taken as the conditional factors affecting the deviation and the determination the company's level of similarity.

It often happens that the analyzed set from the point of view of various features characterizing the objects of this collection contains objects that are very diverse in terms of their condition assessment. They may include objects with both high and low ratings and a whole host of "intermediate" objects.

The task of the proposed systems is to determine what features affect the high score of the object or the exceeding of which limits causes the object to receive a low grade.

The tasks of the system within the framework of 7-Ms are aimed at:

1. signaling disturbances or threats of achieving goals in petrochemical companies,
2. assessment of oil production,
3. assessment of the oil flow,

4.5.3. assessment the Technical and Economic Levels of Development

The MBF-DSD- COC-MBC systems proposed in this work is aimed at monitoring and on-line control of the state of the organization in oil companies and disclosure of symptoms indicating corporate organizational inefficiencies. This is very important from the point of view of questioning the current organizational status in the conditions of the company's activity - in the aspect of early detection of the possibility of disruptions in the functioning of the enterprise.

System Management by Fail (MBF-DSD-COC)

Company assessment and classification procedures based on resources were made on the basis of a "reference point model", which allows assessment at two time points:

- normative point - temporarily, where the benchmark for comparisons, for example for M1, is the oil flow capacity index in the examined period, which is to facilitate the determination of the value of development indicators,

- spatial-temporal point, where the pattern of the level of development of similarity is the class-related receivable of the company based on resources at a given time.

An important task of the MBF-ALL system is to identify the level of the company's development through the values of indicators (signs) of deviation. With this task, the responsible are all the levels of responsibilities in the company.

This is to be by the MBF-DSD system using the values of three indicators:

1) The indicator of a positive level of development (failure-free, successful), that is EA, which corresponds to the values of the positive effect of the operation (greater income from inputs).

2) EA index of the neutral level of development (the beginning or symptoms of the

deteriorating condition), which corresponds to the neutral effect of the action (income = effort).

3) EA indicator of negative development level (failures, failures), where revenue is less than expenditure.

Development indicators (degree) indicate the position of the estimated level of development of companies in relation to the effects of activity, performance, etc., in connection with the existing state of the organizational system and the state of management - the functionality of the company).

Petrochemical companies appearing in the MBF-DSD-COC systems are subject to classification in accordance with a multidimensional comparative analysis contained in the MBF method under the name "level of similarity" and a "multicriteria evaluation" under the name "level of development".

The DSD system, like the COC system, aims to determine the company's assessment and classification according to the FAM procedure. In the MBF-DSD-COC, 7Ms, 5 departments (Divisions) and 3 levels (HL, ML_T, ML_E) can be distinguished in each company, however a multidimensional assessment can only be made on the basis of universal indicators (degree) typical for assessing the same business conditions.

The analysis of comparability and assessment of companies is aimed at identifying the level of development and division of companies on the basis of comparable indicators for companies and indication of departments and levels of companies characterized by a higher business climate in a selected area of activity for a given research period.

Table 4.1. Presents the Divisions (DIV) with the impacts of DV-CF characteristics

DV	DIV1	DIV2	DIV3	DIV4	DIV5	DIV6	CF
M1	M1,F1		M1,F1	M1.F1			F1
M2		M2,F2					F2
M3		M3,F3					F3
M4							F4
M5			M5F5				F5
M6					M6,F6		F6
M7						M7,F7[16]	F7

DIV1 - Pipelines transport, DIV2- Production division, DIV3-Sale Division,

DIV4- Personal Division, DIV5- Accounting Division, DIV6- Information Division

Proposal of assessing the departments (Divisions) by the Levels in the company

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[16] M7- refers to IT frequency of information, while F7 - refers to managerial information

Division	Characte-ristics		LEVELS		
			HL	ML$_T$	ML$_E$
DIV1	M1	F1		x	x
DIV2	M2	F2	A	x	
DIV2	M3	F3	L	x	
DIV4	M4	F4	L L	x	x
DIV3	M5	F5			X
DIV5	M6	F6			X
DIV6	M7	F7		x	X

4.6. Example of using the DSD and COC systems

4.6.1. Crude Oil Company - COC - power of crude oil flow

The second COC system is an attempt to solve the issue of assessing the level of business development, extraction and their classification based on resources. The degree of development means the degree of acceptance by the decision-maker of the compliance of the development results in Time Now in relation to the established plans.

Observing the process of Ml crude oil export by NOC as a whole, not only from the point of view of the participation of individual relatively independent companies of extraction, transport and conversion into export dynamics, its basic symptom is the flow movement, which depends on the proper organizational and technical operation in these companies . All the better or worse organized oil traffic means "Power of oil flow". It starts with transport by pipelines, the process of revisions as needed and ends with loading on the ship. Calculation Indicators of losses W for transmission of the oil as (destymulant) according to the formula:

$$W \ \% = \frac{Qobt - Qtn}{Qobt} . 100$$

W - Indicator of losses

Qobt - quantity obtained,

Qtn - quantity of transmission

The flow power can be determined as a percentage using the flow rate indicator", which reflects the transmission of the obtained oil for further disposal

For example:
1. C4 received 20 tons of oil and sent 20 tons for export
Flow power factor (W)
W = 1-20 / 20 x l00 = 0% (destimulator)

2. C3 received 40 tons of oil and sent 20 tons to C4
W = 1 - 20/40 x l00 = 50% (destym.)

3. C2 got 40 tons and sent 40 tons to C3
W = 1 - 40/40 x l00 = 0%

4. The company Cl produced 40 tons. Its production capacity is
60 tons. Hence, unused production capacity equals:
1-60 - 40/60 x l00 = 66.6%

Ml - Manufactured goods
Ml presents mining and provides:
a) by OPEC extraction per day or per year
Ml = 0.5-5 million b / d
b) by NOC:
Ml = 1-3 million b / d and this will be accepted in the hearing

1. The company Cl Ml = 2 million b / d and is based on NOC:
By Night 2/3 · 100 = 66%
The company Cl sends to C2 2 million b / d

2. The C2 company will receive from the company Cl 2 million. b / d
C2 sends C2 to 2 million b / d, which means:
Company C2 has 2/2 · 100 = 100%
If C2 sends only 1 million b / d to company C3, it's a company
C2 will have ½ · 100 = 50%

3. The C3 company has received 2 million b / d and converted into 2 million b / d
products to 100%

4. C4 for export sends the same, it also has 100%

M2 - Machines
Name of the feature: number of failures on day 2-4 destimulant

M3 - Material
Feature name: storage time 2-4 days destimulator

M4 - Man
Name of the traits: absenteeism or compensation for accidents

M4 - Market
Name of the feature just In time (exact on time)
And that is the time to fulfill the order 14-21 din destimulant

M6 - Money
Name of the feature (Effect) (%)
For example for company C1:
Quantity of extraction / costs, e.g. for company C1

For C2, transport, etc.

M7 - Manegerial information
Name of the feature: frequency of information:
Every day 30/30 · 100 = 100%
Once / week. 4/30 · 100 = 14%
Once / stomach. 3/30 · 100 = 10%
Once / month. 1/30 · 100 = 3.3%

4.6.2. Classification and Ranking of oil fields

Type of qualification Classes

The purpose of the qualification Classes:

The qualification classes serve the decision maker for the purpose of investigation the interconnection between the Characteristics Values, namely Decisive Features-Conditional Factors, the productivity and performance to be fully aware of the problem of:

I. The relationship between the individuals and their "CV" in spaces and in time from the point of view of two important issues:

1. Dependency: that is the state or condition of an item to be relied on other individuals or their characteristics "CV". This topic enables to study the **cause-effect relationship**, for example, the impact of producing products with bad effects on the human environment on the basis of *an ad hoc decision* to take *a rational decision* in real world (TN).

2. Correlation: an action in which one thing (item or characteristic) affects or depend on another. This topic enables to study the **correlation between the variables** (features-factors) of individual objects in order to study the participation **(Interaction)** in the level of development of objects to realize various goals, for example to select the appropriate offers on the basis on a rational decision in order to reduce costs related to the planned investment.

II. The occurrence (Interaction[17]) of an event or activity due to *an action* to be taken under existing conditions to study the states of items. their "CV" and cooperative & (Coexistence).

The results of an action enables the decision maker to separate the items into different groups according to their state, quality or development with the actual existing relations [inter cooperation, interdependence –codependence, or dependency] in TN as follow:

1. *Interco operation*, to perform an *event* or activity (a piece of production-work).

---

[17] Lead to an effect of DF-CF-, on each other as interaction between Productivity & Performance where the actions of productivity and the activities of Performance lead to an event OF supply M1 to satisfy the Market (M5) demand.

2. *Interdependence codependency,* where the results will be decided by the occurrence in the present conditions (level and state of an individual or the values of characteristics) in TN to produce the level of development in TN.

3. *Dependency* that is the state of (Wealth) finance needful and technical requirement to support an event or activity of an individual.

1.Class type "A" (Equal Impact)

Formed a set in one class with the **same objects** according to their characteristic features "Yi" of the level of development and they form <u>one class in the space of factors</u> as a result of involving the factors "Xi"[18] with identical Influence or **Impact** in reaching a particular goal and to present the same **effort of performance** – "interaction" and the same **cost to be charged** to reach the level of productivity (**Development Level –DL"**) which lead to the same **state of similarities** in each company.

On the other side this set of objects can be assessed from the point of view of the effect of factors "Economic activities-event" in shaping the state level of performances that is the technical actions and functionalities of objects on the basis of the same costs due to the economic conditions (state of similarity). This side depends on the selection of partial factors.

 Taking in concern the obtained indicators for both the degree of Technical actions and indicators of the of the Economic activities "similarity", the decision maker can be able to determine the strength and direction "interaction" of the relationship between the determinants of the economic usefulness for the chosen Decisive Features of the technical usability to study any impact on the values of the Development Level-DL for any object on the basis of synthetic factors to take a rational decision.

2.Classes type "B" (Equal Productivity-EP)

combines of objects that form one class due to their "Yi" characteristics of the " level of development" that the same level of productivity and belong to different sub classes as a result of involving the factors "Xi" depending on the chosen factors to study their influence on the features that shape the Development Level of Productivity. These sub classes   presents different levels of prices, costs of performances and the ability to sell the product.

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[18] By engaging factors, it means any interconnection, i.e. the relationship between the factors and the features (economic conditions and technical variables).

3. class type "C" (Equal Performance EP)

Objects form different classes of productivity in the feature space due to their "Yi" level of productivity and allotted to different classes of performance according to their different levels of productivities for the same product (M1) belong to different classes (categories) of destination as follow settled in this study:

Where :

M1 ≥ M2 ,   M2 ≥ M3 and that lead to M1 / M3 or M2 / M3 presents the real technical action / the economic effect and to be presented as the Development Level DL.

Where :

M1 – extraction of oil,

M2 - real amount in disposal,   +

M2 – M3 have not sold oil,

M3 – in the system of evaluation is denoted by (M3$_{exp.}$ As the amount for export [tons/month] where M3 ≤ M2 – Y03 presents sell out quantity for abroad (**event**) as DL.

4. Class type "D": Different Varieties "DV"

different companies, that are not either the same type of the productivity nor the performance. It contains objects belong to different sub classes in the feature space as different objects of the level of development of productivity due to the impact influence of the characteristics of Conditional factors "Xi" from one side, and different the states of economic activities "similarity". Therefore belong to different classes due to the factors characterizes their "Yi" "degree of level of development". This allows to evaluate the share of " the impact "of individual factors in shaping the" level of development or the qualities of the product "(Technical and Economic implementation).

Table 4.2. The Board Guide of Patterns allocation for classes of observations

Assessment of population in terms of features and factors

2. Interaction between (Productivity & Performance)- to satisfy the (Demand & Supply)

NO	Type of class	Productivity classes Product Development Level	Performance classes Manufacturing State	Relationships: -dependency, -correlation Co-operation & occurring: -event, action -inter cooper., codependency
		Decisive Features-DF	Conditional Factors-CF	
		Allocate individuals for classes	Allocate individuals for classes	
1	A	[(1;2;3;4)] one class [1] **	[(1;2;3;4;)] one class [1]* *	[1,1] Equal Impact "EI"
2	B	[(1; 2; 3;4)] one class [1]*	[1] [2] [3] [4] Diff.CL [0]**	[1][0]Equal Productivity "EP"
3	C	[1][2][3] [4]Diff class [0]**	[(1; 2; 3; 4;) One class. [1]*	[0] [0] Equal Performance „EP"

4	D	[1] [2] [3] [4] Diff.CL [0]**	[1] [2] [3] [4] Diff.class [0]* *	[0] [0] Different Varieties "DV"

Class A[1]* * Equal Impact "EI" – to have the same one results (effect) in the companies due to DE-CF,

Class B[1]* Equal Productivity with different impact of Performance of work [0]**

Class C[0]**Different Classes of Productivity obtained due to one effect of Performance [1]*

Class D[0]** classes of companies that differ from others in the same field of Productivity & Performance

Practical Application

The effect and the outcome drawn from assuming the M1 as the Development Level is based on the work hypotheses, goals and the thesis. The conception of MBF-MBC within DSD and COC systems, allows the assessment of the *Development Level* of the company's technical organization and economic levels of development, to obtain many variants and **results** in selected companies in a given period with the proposal systems and according to the thesis settled before. The decision maker has the possibilities to establish a company's Development Level by assessing the **ex post** Development Level (M1) using the DSD system (fig.4.9):

Fig. 4.9. Ex post assessing according to DSD
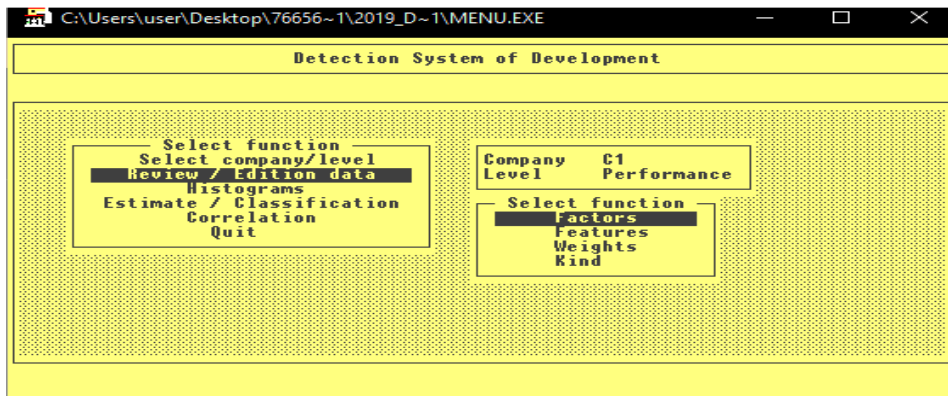
While in "Time Now and Ex ante" ,the COC system enable to know true facts in time now and to obtain an original copy of the future.

Fig. 4,10. TN assessing and Ex ante copy of development level according to COC
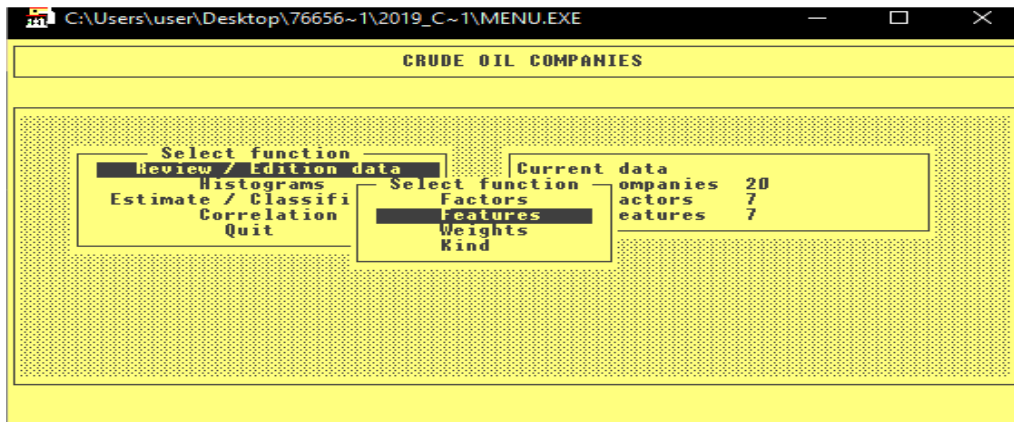
The procedure of choosing 3 Companies to apply a further Controlling

Of <u>Economic level</u> taking in concern the <u>Technical Level</u>

Characteristics Values of the companies :

<u>Technical Level- with Features :</u> (Level of Development)

1. M1 - level of oil - extraction [Barrels/month] = (M1 ≥ M2) – Y01
2. M2 (M2 crude oil transportation) amount M2 ≥ M3$_{exp.}$ [tons] Y02
3. M3 (M3$_{exp.}$ Amount for export [tons/month r] M3 ≤ M2 – Y03
4. M4 working hours per employees (month) –Y04
5. M5 actually company supply of M3$_{exp.}$ - Y05
6. M6 signed contracts –gains from export M3$_{exp.}$ / Y06
7. M7 Managerial Intelig. Information [Reports account of the information] Y07

Economic Level Conditions : (Operational Benefit oil export with M6 M3$_{exp.}$)

M1 present export restrictions "of OPEC" in relation to extraction (Level of Development) as in the equation :

$$\frac{M3exp.}{M1} \cdot 100 \%$$ (real Technical actions)

 Or:

$$\frac{M3exp.}{F03} \cdot 100\%$$ (real Economic activities)

Where :

Y03- the amount M3$_{exp.}$ Economic activity of a company as the effect of export resulting from the expenditure on the extraction of petroleum M1 to constitute the level of development of a company as Market oil exported– F03

Y03 – M3- M3$_{exp.}$ /F03 real economic activities

Y01 – level of extraction M1 as technical actions with OPEC limit as Economic activities –F01

Y02 – pipeline capacity with pipeline stoppage- Fo2,

Y03 – real amount for export $M3_{exp.}$ Economic effect as Benefit gains from export M6- Y06

With Market order exported - F03

Y04 - Working hours per employees- with Sickness absence of employees - F04

Table 4.3 . Proposal of Characterize Values in the systems Selection of variable

Variables of Decisive Features			Variables of conditional Factors		
Symbol	Specification	Symbol	Symbol	Specification	Regarding (Companies)
M1	M1 - level of oil - extraction [Barrels/month]	Y01	F01	OPEC Limitation quant. (nominate)	
M2	(M2 crude oil pipe transportation capacity	Y02	F02	Pipelines stoppage per month	
M3	($M3_{exp.}$ Amount for export [tons/month]	Y03	F03	Market Order- exported	
M4	Working hours per employees per month	Y04	F04	Sickness absence of employees - per month - desty	C1 & C2
M5	Technical Level Capacity – company supply	Y05	F05	actually market demand for $M3_{exp}$	
M6	Signed contracts- gains from export $M3_{exp}$	Y06	F06	The number of contractual penalties -	
M7	Reports Account of Information /days/	Y07	F07	Frequency (time) of information flow - sty.	

Table 4.4. Relationship between Resources, Functional role of activities, organization of Levels responsibility

Insti[19] D&F[20]	Functional														Score Number
	Decisive Features							Conditional factors							
	Resources of performance							Functional Factors of connecting							
	7 M							M1 ⇩ F1,F3		M2	M4	M5	M6	M7	
	M1[21]	M2	M3	M4	M5	M6	M7	F1	F3[22]	F2	F4	F5	F6[23]	F7	
HL, MS	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
ML, TS	1	1	1	1	1	0	1	0	0	0	1	0	1	1	9
ML, ES	1	0	0	1	1	1	1	0	1	1	0	0	1	1	9
LL, FS	1	1	1	0	0	0	0	0	0	0	0	0	1	0	4
	4	3	3	3	3	2	3	1	2	2	2	1	4	3	**36**

HL – High Level decision maker for Organization of the Management System

ML – Mid Level Decision Maker for Organization of the Technical System

ML- Mid level for Organization of the Economic System
LL – Low Level for Functional System

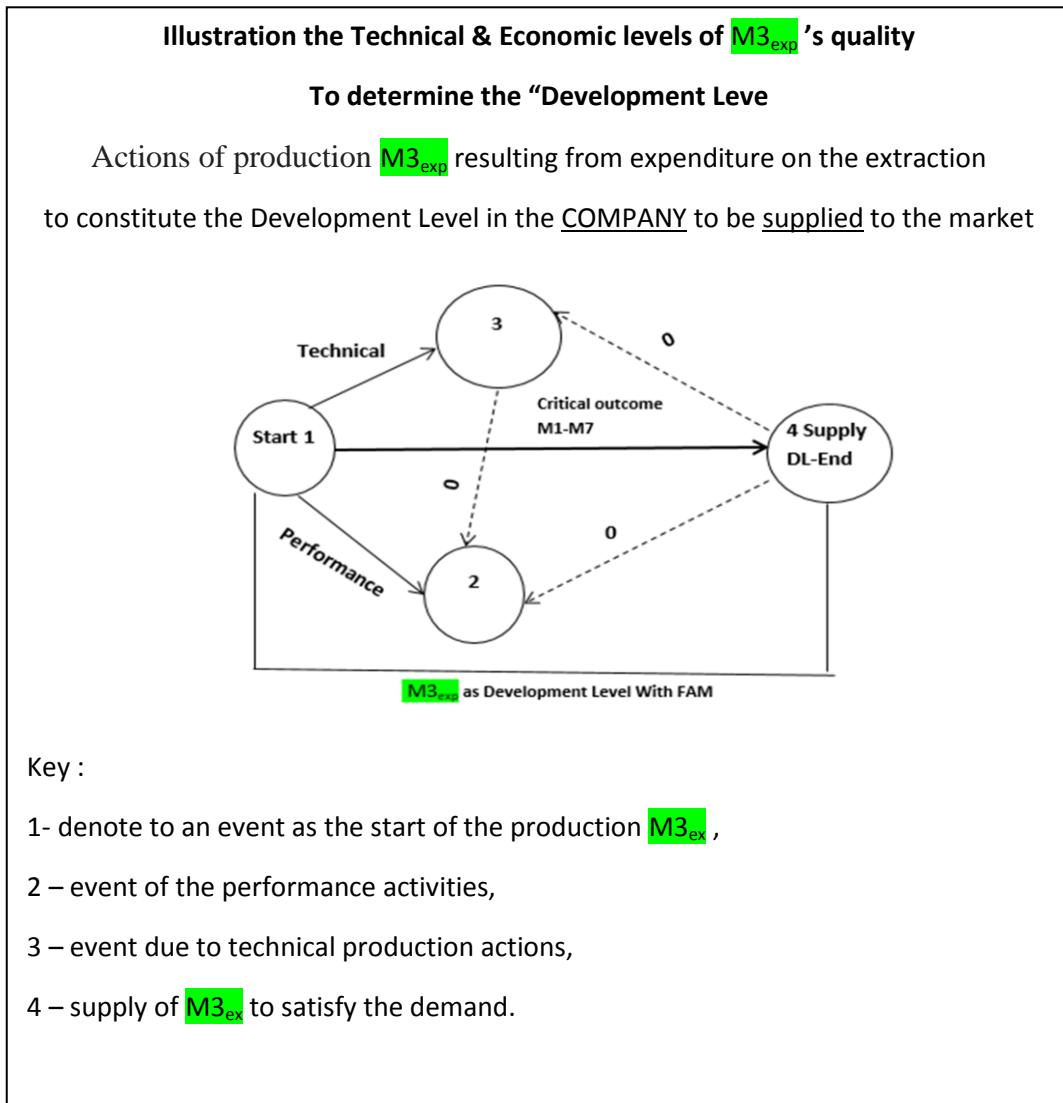[19] Refers to Institutional authority with **direct** or **indirect** influence for the decision making
[20] D –Decisive Features and Conditional Factors
[21] Occurs twice time as feature or factors with **direct** influence and decision making
[22] Occurs once with **indirect** influence and decision making
[23] Occurs with no influence

Fig.4.11. The economic effect resulting from the expenditure the extraction

to constitute the Development level

Illustration the Technical & Economic levels of M3$_{exp}$'s quality

To determine the "Development Leve

Actions of production M3$_{exp}$ resulting from expenditure on the extraction

to constitute the Development Level in the COMPANY to be supplied to the market

M3$_{exp}$ as Development Level With FAM

Key :

1- denote to an event as the start of the production M3$_{ex}$,

2 – event of the performance activities,

3 – event due to technical production actions,

4 – supply of M3$_{ex}$ to satisfy the demand.

Fig. 4.12. Illustration the Technical & Economic levels of M3$_{exp}$'s quality

To determine the "Development Leve

Economic activities requesting for the M3$_{exp}$ as the Demand of the MARKET
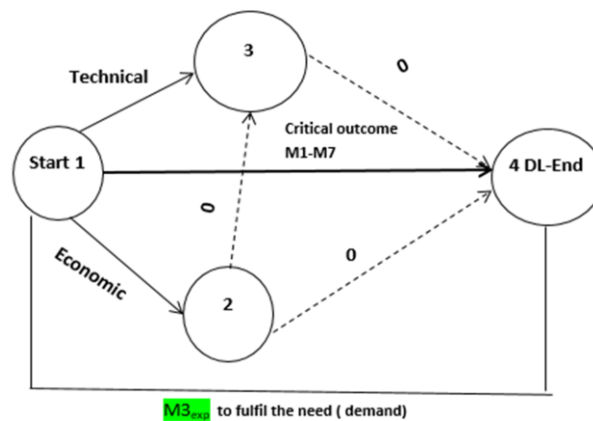
Key ;

1 – demand of the market for negotiation,

2 – event of reaching an agreement,

3 – settlement of technical conditions,

4 – final acceptance

5.1. The relationships in the dependency network
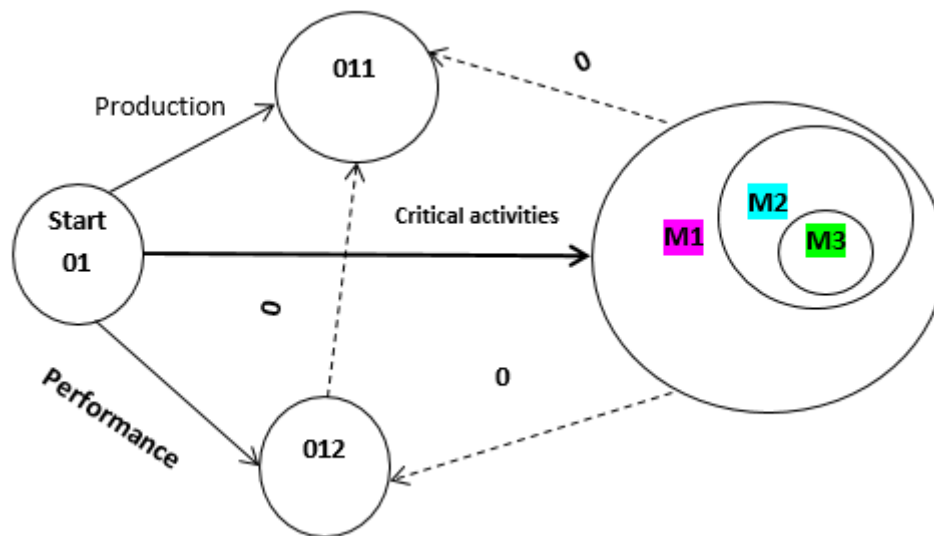
Level of Company Production (MBF-MBC) & Region Economics within the 7M of FAM).

Fig. 4 13. Level of Company Production (MBF-MBC) & Region Economics within the (7M of FAM) – own study

The relationship in the dependency network (fig.4.13) presents the interaction between _the production's actions of manufacturing a_nd the _Performance's activities_, to be presented as a **Resultant** (consequence of oil extraction presented as a whole oil of extraction M1) .

where:

M1 = M2 + M3

- M2 – have not sold oil,
- M3 – presents sell out quantity for abroad (**event**)

1. The M6 is a criterion of great capacity Fig.4.14,4.15), to assess the impact of oil export quantity $M1_{expo.}$ on the Economic Level – as F01 stimulant.

2. The oil not exported quantity $M1_{n.expo.}$ reflects the value of lost as (F02 none stym..).

3. While the level of Costs for the manufacturer reflect the level of production and performance according to the taken actions.
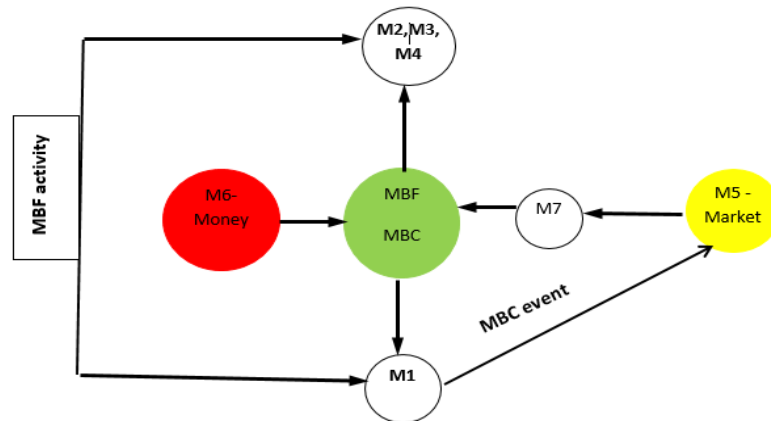

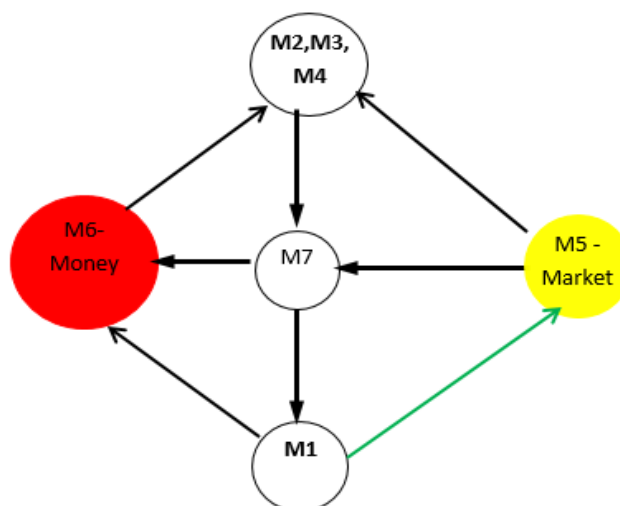Fig. 4. 14. Level of Company Production (MBF-MBC)

& Region Economics within the 7M of FAM).

Fig. 4.15. shows the position of the M1 and

its role as a degree of development

Theoretic chosen in TN (as a copy) with confirmation (original), that are the 3 companies which obtained acceptable level of development by the decision maker and to be discussed and negotiated the required standards with the medium economic manager.

Practical Confirmation- that is the further decisions according to the results obtained by the systems (influence under controlling) to change according to real situation.

This is refers to the levels of development both Technical and Economic, on the basis of the acceptable standards values.

Characteristics Values "CV" –Technical quality & Economic State

The authors of this research assumes, that the Characteristics Values "CV" of the analyzed companies cover the **Technical Level** presented by the Deceives Features "DF" which enables us to **assess** the Degree of productivity in a company "score of position of quality", while the **Economic Level** "Conditions of productivity" is represented by the Conditional Factors "CF" with the Favorable Conditions to be assigned the "Grade of measurements for practicability – that is similarity of work", that is the sensible or realistic to be suitable into practice". The Conditions Factors enables the decision maker to assess the "the similarity grade of a company (see the following table).

Table 4.5. Characteristics Values

Characteristics Values "CV" of a company			
Decisive Features "DF"	Unit of measurement	Conditional Factors "CF"	Unit of measurement
Technical quality	Degrees of quality	Economic State	Grades of similarity level
Level of Development	level of productivity	Level of conditions acceptance	Level of similarity level

When using the FAM method, for the process of classification the population in sub groups of companies in a "development links" that are classes of individuals – companies- at the same Technical or Economic level of development to be linked to form one class with the numbers of the individuals in the chosen population.

From here the measure of similarity enables the decision maker to classify and assess the individuals in the sub groups basing on their characteristics (Decisive Features DF & Conditional Factors CF).

DF- producing a particular or definite results- Technical Level degree of quality.

CF-cause, influence or interaction Technical Level and Economic Conditions – Grade of similarity.

 THE basic goal of the applied systems (COC and DSD), in this research aims to study mains problems of ***dependability between DF-CF*** as follow :

1. the interaction[24] of supply $M3_{expo}$ and the market demand, taking in concern the

   Dependence of this value on the main extraction of oil M1 as the Technical Level

   Within the Economic Level (critical Path), and the limit of M1 setting by the OPEC.

   All this intend to settle the "Development Level"

2. the *Interco cooperation* between level of oil extraction M1 "Y01" and amount **M3** "F01" – Monetary good.

3. the *dependence* between pumps capacity per hour of pumping M3 and pumps stoppage by hours F04,

4. the <u>dependence</u> between financial dependency represented by Monetary good M3) and oil extraction M1 .

By using the measure of similarity, the system divides the set of the companies into separated subsets (classes) from the point of view of a specific criterion based on the chosen features or factors.

By selecting the appropriate features and giving them an appropriate level of importance, we can evaluate the Development Level of the companies as well as classify them.

The procedure to classify & assess the companies basing on their characteristics as follow:

      1. transformation (normalization) of characteristic values,

      2. classification of the companies based on their characteristics

      3. evaluation of the companies based on their characteristics (and importance of criteria).

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[24] The interaction means here to have an effect of each other
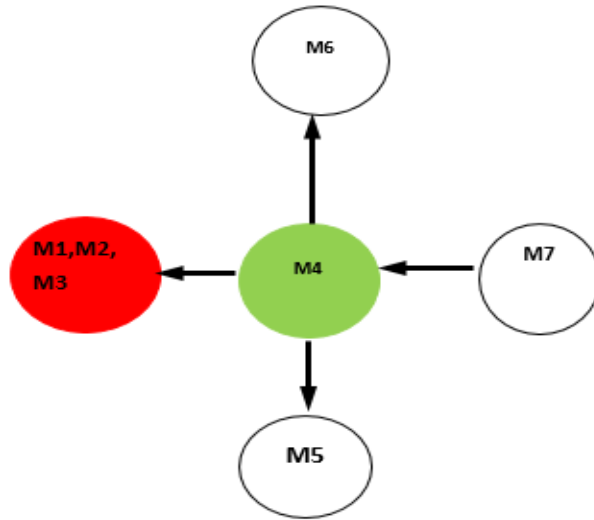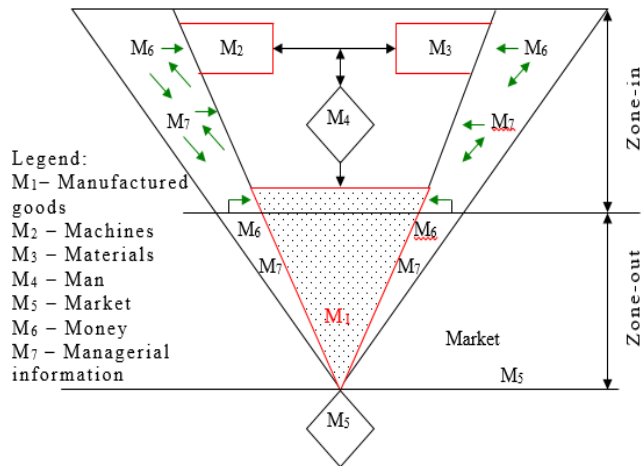
Fig. 4 16. The seven M in FAM's Pyramid

Fig. 4.17. MBF - within the simultaneous model S

M6 Money, M7 Information, Market (M5), (M2,M3) Production with performance- to produce (M1) (M4) Decision maker

Within the 4 M, the FAM method considers additional 3 M to make a decision (fig 4.16.4.17). Then we can say, that the 3 More M already are located within the 4 M; so the synergy between (M2 –Material) and (M3 Machines) gives the Product M1, while the M6 – the Money related always to synergy between the M1 – product (zone in) and the Market M5 (zone out) to satisfy the demand; then the decision maker M4 with the synergy of the information M7 and M6 in different fields allows him to check the stabilization of the production and the performance take various decisions.

Companies are allocated to the suitable classes of qualification that are the companies of the same advanced level of development "productivity" or state of similarity "performance". The qualification is made on the basis of the allocation of the companies on the basis of **D**ecisive **F**eatures according to their degrees of productivity to be assigned by production level indicator "EA" as the **level** of development, and on the basis of for the **C**onditional **F**actors of the **similarity** according to their ability or quality by the grade of similarity "EA".

Table 4.6. the development level and the similarity level (state)

Technical Links					Economic Links			
DF					CF			
No Com.	EA	Cl.No.LIN	Range		No Com.	EA	Cl.No.LIN	Range
3	0.8906		0.6678-		10	0.6271	CL1	0.6271
4	0.9500		0.9500		1	0.0000		0.0000
5	0.9264	CL1			6	0.0908		0.5236
10	0.6678				7	0.3835		
14	0.8475				9	0.4041		
15	0.7819				11	0.2948	CL2	
1	0.0000		0.0000-		12	0.4660		
2	0.3997		0.6094		16	0.2473		
6	0.0611				17	0.5236		
7	0.3419				18	0.4338		
8	0.4092				19	0.5227		
9	0.4264	CL2			2	0.4402		0.4402
11	0.2450				3	0.8303		0.8809
12	0.4019				4	0.8809		
13	0.5800				5	08568	CL3	
16	0.1844				8	0.4745		
17	0.5389				13	0.4944		
18	0.5675				14	0.6769		
19	0.6094				15	0.7038		
20	0.7275	CL3	0.7275		20	0.8538		
Technical Development level: Managing basing on Y01 to Y07					Economic Development level: Controlling basing on F01, F02, F03			

Arrangement of companies into classes of development degree based on features "organizing their productivity position" and on factors organizing their economic position (see the allocation to Technical and Economic links)

The importance of the Simultaneous Model – S
in the implementation of strategic activities
The definition of the **Strategy** within the model S means a plan designed for a particular purpose with the process of planning and carrying out actions to reach this purpose. Hence strategy can be defined as the theory and practice of preparation, measurement, evaluation and management of the intended goal. And at this point it should be emphasized that *__strategic decision is made on the basis of an ad hoc decision.__*

On the other hand the **Simultaneous Model – S**, enables the researcher to produce or realize an **original new design** or **idea** to be existed in the real world in Time Now- for example,

the energy transformation through new technology, or the selection of the best commercial offer with an evaluation at the same time. These are decisions outside the company (zone out) with strictly defined goals related to the company's operations (zone in).

To construct the model S, the researcher ought to indicate the theoretical and technological useful goals to create a special model for his purpose. For example to create a special model of the oil demand for a customer to be made of various mixtures of empirical oils.

Hence, the decision-maker has the ability to measure, evaluate and manage the level of development of objects on the basis of their Characteristics Values "CV" to enables the ranking and classifying objects.

Is it really that, the achievement of the "level of similarity" or "level of development" of the companies is a theoretical goal of great scientific achievement or practical reality action objective of classification of the oil fields?

The oil field can be divided by the size of the oil production area into small, medium and large. We make this division not only and not primarily to know the level of oil production depending on the size of the area, but to examine the conditions and features of extraction in each of the obtained groups. The conditions and characteristics are defined by the criteria characterizing the areas and relations between the criteria. Note that not all classes (groups) must have the same assessment criteria. Small areas have few holes for mining and small numbers of wells, while medium and large areas have medium and more number of well. Natural mining conditions (distance from ports and refineries) and technical and economic characteristics (oil quality, mining costs) are also characteristic of mining areas.

The task of the "COC" system is the classification of areas on the basis of the factors M2-F2, M3-F3, M4-F4, M7-F7 characterizing the "level of similarity" which determine the "level of development" in a given area.

As a result of the division of oil fields, classes can be distinguished that combine areas by the classification of areas in the spatial of features that determine the level of development and factors determining the level of development (see the COC system). The implementation of this objective makes grouping (classification) conduct useful for practical purposes and for comparability of areas. Also, using the COC system, it is possible to quantify and determine development indicators.

The system divide the oils areas into four classes such like A, B, C and D according to their positions in the group called classes of qualifications according o the categories of degree of development or indexes of similarities as shown in table 4-1.

As we settled before that the level of development of an individual has two indicators:

EA⁰ – the indicator that presents the **state** of development level - usually for the **D**ecisive **F**eatures of the development level, while the :

EA^{1} – the indicator that presents the **similarity** of the development level usually for the

 Conditional **F**actors of the development level.

S^{0} –symbol for the same *each joining class* which contains the same individuals in the same class of development, either for **DF/CF**

D^{1} – symbol for *different joining classes* which contains different individuals with different level of development (different classes of joining), either for **DF/CF**

In order to allocate the individuals to the suitable class of joining, we create four classes of qualifications for the **D**ecisive **F**eatures of the **state** development level, and for the **C**onditional **F**actors of the **similarity** development level. These classes are A, B, C, and D.

Table 4.7. qualifications individuals

Class of qualification	Joining class for DC level	Joining class for CF level
A	S^{0} (0,0)	S^{0} (0,0)
B	D^{1} **(1,1)**	S^{0} (0,0)
C	S^{0} (0,0)	D^{1} (1,1)
D	D^{1} (1,1)	D^{1} (1,1)

Notice:

Class A individuals in the same class of the state level and the same class of similarity level,

Class B individuals in the same class of similarity level, but they are in different classes

Of the state level,

Class C individuals in the same class of the state level but they are in different classes

Of the similarity level,

Class D individuals which are allocate to either different classes of joining either for the

State level and the similarity level.

In my opinion the basis for the dichotomous division is made on the basis of an ideal division, i.e. in line with expectations according to existing norms (normative division). While in the proposal method, a multi-class division is used, this is compatible with the objective state, i.e. the level of development of the population under study. Hence the empirical division was named. This division is not made according to the standards, but

depending on how much the statistical unit has reached the level of development or development level similarity to other units in the population. For this purpose, in this method we use the qualification class to assess the level of development and the level of development similarity. You can note that, the MBF is a dynamic method that verifies each element of the set separately. And at the same time the whole collection together.

The author of the dissertation assumes, in a working way, that the influence of company resources in assessing the level of organizational development is as in the pyramid of resources as in the assessment of the state of stabilization.

In the resources pyramid, we distinguish three areas of resource impact:

1. Internal area - zone in, that is potential personal and material-technical and the potential associated with the assessment of the internal activity of the company and the level of development of the organization from the point of view of the level of management and the technical-economic level. This area includes an assessment of the impact of resources on:

- the level of development of production organization (mining) for M1 - managerial product, M2 - machines and M3 - materials,
- the level of development of work organization for M4 - man,
- the level of development of an economic organization related to the organization of production and work.

2. The external area - zone out, that is, achieving valuable measures of extraction and natural social expectations. It includes the assessment of the stabilization of the company's position in the market situation (M5).

3. M7 and financial information area M6. This area coincides with the area of all spheres of activity and the implementation of the company's functions.

The assessment of this area is based on the analysis of information inside and outside the company and is an important factor shaping the company's strategy on the market. Continuous collection and receipt of information is important for the decision-making process.
In addition, the assessment of this area is based on the company's economic analysis from the M6 point of view, both in terms of maintaining the company's operations (position) and its development.

For the diagnosis of this area, the values of economic indicators such as profit, costs, revenues... etc. should be taken into account.

The results of the classification and assessment of the companies facilitate making difficult decisions and allows the use of financial resources for the development of companies and the equalization of the quality of social life.

4.6.3. Selection of evaluation criteria within the 7Ms- 7F

The analyzed set contains companies that are very diverse in terms of organizational level assessment. There may be companies among companies with both high and low assessment of the organizational level and a whole range of "intermediate" companies. How to look at a set of companies from a COC system perspective to be able to determine what features have an impact on a company's high rating or overrun, what limits cause a company to receive a low rating? Do individual features have a synergistic effect on the overall regional level assessment or not? Which characteristics of the surveyed companies significantly determine the level of development of the company, which can be ignored? These are difficult questions, especially that considered in a multidimensional system. In addition, it is not known, and which feature systems may there be interdependencies. It is therefore necessary to study all combinations of features in turn.

4.6.4 The process of measuring and criteria of judging the level of development

The function of the measurement in the systems meters used in assessing the activities of oil companies depends on the choice of the combination of criteria used. The measurement fulfills two functions:
   1. a synthetic indicator (complex high capacity - all 7Ms), meets the decision-making criterion in the studied area,
   2. a partial indicator (auxiliary-extra), to fulfills an information of special need. As mentioned before in the MBF-DSD-COC, the evaluation problem depends on the selection of the reference system, - <u>normative</u> system, where the comparison is planned (for example for company C4), or <u>time system</u>, where the comparison pattern is the size achieved in the past period, taking into account comparability conditions (for example, performance of tasks for mining companies in a given period in comparison to the previous period), and finally for the <u>spatial layout</u>, where the comparison pattern is determined by the amount achieved at the same time (year) in company C1 and C2.

4.7. Application the research methodology to achieve the purpose of the work

As mentioned in chapter 2 (2.2.4), inspiration for the research problem at work boils down to seeking maximum simple and effective methods of research support and detection, which dominates the process of assessing the development of the oil sector development strategy in a tie of dependencies, phenomena, events, states, in order to make and choose decisions regarding adjustment of economic opportunities to the internal and external situation of Libya.

To achieve the basic goal, an attempt is made to achieve methodological results by answering the following questions:

1. What model of development pattern should I use to study the level of organization of an   enterprise?

2. What are the most important, the most convenient and the most adequate measures of value and nature in assessing the level of organization development?

3. How to measure relative differences and similarities between individual companies?

4. How to divide (classification) four petrochemical companies that are very similar to each other, and some show dissimilarity?

5. How to quantify the taxonomic value of the organizational level development meter?

In resolving the above issues (to various degrees of cognitive and practical), the thesis that it is possible to develop a method for assessing the stabilization of the petrochemical company's activity based on selected criteria that allow the assessment of the organization's level of organization and adoption as the best variant of the one in which the level The development of the organization meets the achievement of valuable measures of oil production and natural social expectations in the analyzed period.

It should be emphasized that the elements of assessing the level of development are included in the both system are demonstrated in the appendix.

Table 4.8. Allocation of companies to classes-Technical and Economic Links

Technical Links					Economic Links			
DF					CF			
No Com.	EA	Cl.No.LIN	Range		No Com.	EA	Cl.No.LIN	Range
3	0.8906		0.6678-		10	0.6271	CL1	0.6271
4	0.9500		0.9500		1	0.0000		0.0000
5	0.9264	CL1			6	0.0908		0.5236
10	0.6678				7	0.3835		
14	0.8475				9	0.4041		
15	0.7819				11	0.2948	CL2	
1	0.0000		0.0000-		12	0.4660		
2	0.3997		0.6094		16	0.2473		
6	0.0611				17	0.5236		
7	0.3419				18	0.4338		
8	0.4092				19	0.5227		
9	0.4264	CL2			2	0.4402		0.4402
11	0.2450				3	0.8303		0.8809
12	0.4019				4	0.8809		
13	0.5800				5	08568	CL3	
16	0.1844				8	0.4745		
17	0.5389				13	0.4944		
18	0.5675				14	0.6769		
19	0.6094				15	0.7038		
20	0.7275	CL3	0.7275		20	0.8538		
Technical Development level: Managing basing on Y01 to Y07					Economic Development level: Controlling basing on F01, F02, F03			

The indicators of the development level according to groups of individual's states of their levels as follow:

1. state to 0,24 (*unstable state*, that is not likely to fail and not to improve),

2. state 0,49 (*un stabilized state*, that is not stabilized yet),

3. *stabilized state* in TN 0,50- 0,75 (stability),

As earlier mentioned, the qualification classes serve the decision maker for the purpose of investigation the interconnection between the Characteristics Values, namely Decisive Features to assess the productivity "Technical Level" in the companies, and the impact of the Conditional Factors on the level of productivity to be fully aware of the problem of Economic level, that is the quality of the products to be accepted by the market.

The proposal system offers a particular way to check the problem of the Technical Level linked with the economic level. So, in CL1 a set of companies was allocated in one class according to their characteristic features "Yi" of the level of development that is the level of productivity (for example the company no. 4 the degree of productivity is equal = 0.9500 the highest indicators of development – that is means the highest a lot of oil production. And at the same time this company has low indicators of the economic level (CL3 EA= 0.8809) that is a little amount of oil sold abroad. The same with the company no. 3 EA =0.8906 Technical Level, while Economic level= 0.8303.

On the contrary, to clear these situations, the decision maker notices that the company no. 8 in the class of productivity obtained a degree EA = 0.4092 in the CL2, that a little amount of oil production, while concerning the level of Economic it obtained high index of export EA = 0.4745 in relation to the productivity- this means the quality is accepted by the market than the quantity.

Regarding the classification to the "A" qualification class, the decision maker pays attention to the appropriate conditions for organizing productivity in the company no. 20 qualified this company to the technical level on the basis of the obtained degree equal EA = 0.7275, and this was related to the fulfillment of the wishes of the economic level of the index EA = 0.8538, where most or all of the products were accepted by the market. This situation means that in this company all activities related to productivity are under control. Contrary to the company no. 1, where the degree of technical advancement is 0.0000, which affects the result of the economic level at EA = 0.0000. it means that the activities related to the organization of production are out of control.

From the tables of Technical and Economic links the decision maker has a lot of situations to check the quality and the quantity problems with the qualification classes and there are many cases and situations to be checked as in the above tables.

Notice the reason for rejection the products:

1. Poor quality of crude oil and refusal to accept a large part of the production,

2. Administrative reason, i.e. failure to ship production at the specified time and destination.

3. The market has not accepted large quantities due to the high price.
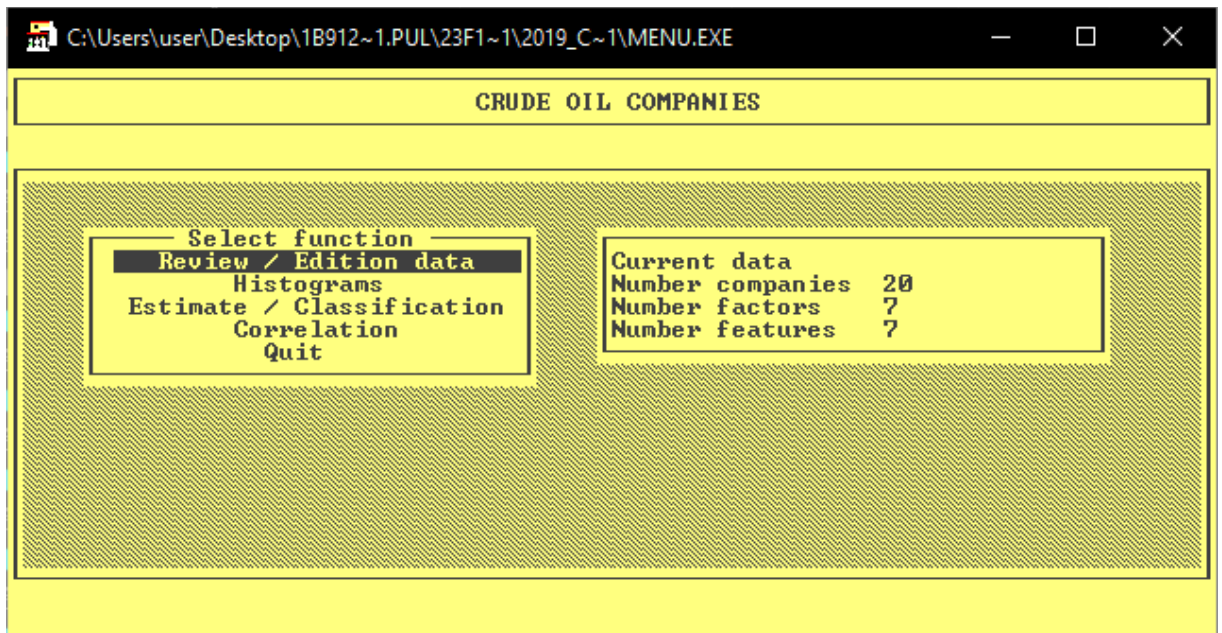
Fig. 4.18. Menu of the System COC

Fig. 4.19. Classes of Technical Level – basing on Decisive Features
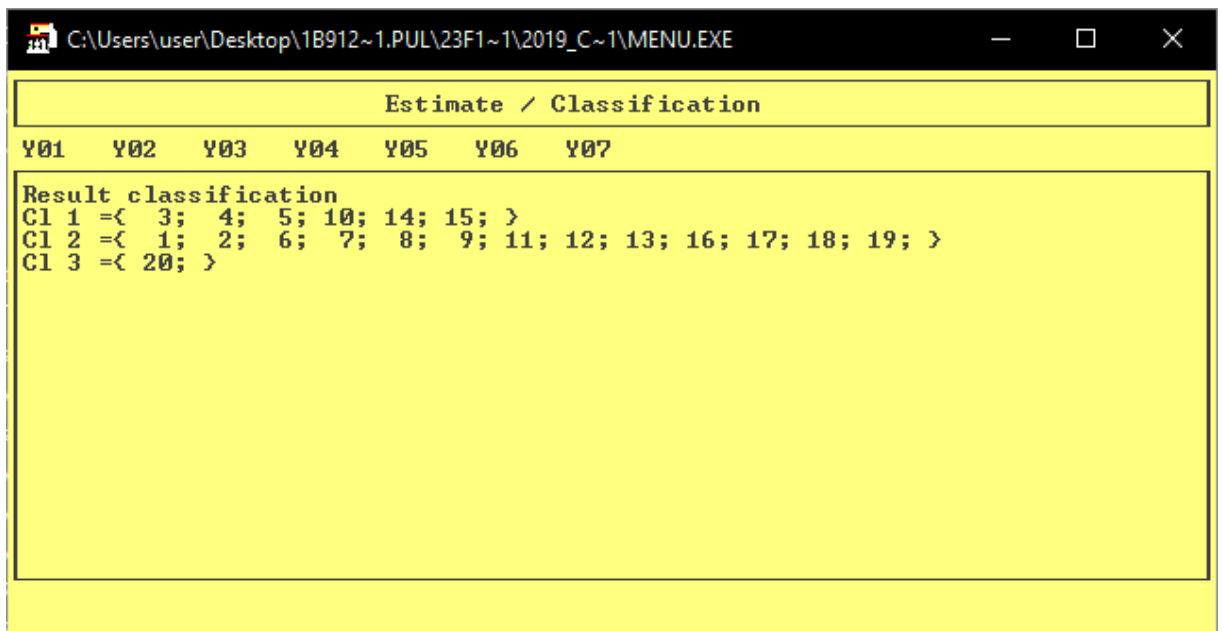
Fig. 4.20.Grades (degree) of development


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                    Estimate / Classification

Y01     Y02     Y03     Y04     Y05     Y06     Y07

Estimate districts  EA
            EA   1  = 0.0000
            EA   2  = 0.3997
            EA   3  = 0.8906
            EA   4  = 0.9500
            EA   5  = 0.9264
            EA   6  = 0.0611
            EA   7  = 0.3419
            EA   8  = 0.4092
            EA   9  = 0.4264
            EA  10  = 0.6678
            EA  11  = 0.2450
            EA  12  = 0.4019
            EA  13  = 0.5800
            EA  14  = 0.8475
            EA  15  = 0.7819
            EA  16  = 0.1844
```

Fig. 4.21.


```
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                    Estimate / Classification

Y01     Y02     Y03     Y04     Y05     Y06     Y07

Estimate districts  EA c.d.
            EA  17  = 0.5389
            EA  18  = 0.5675
            EA  19  = 0.6094
            EA  20  = 0.7275
```

Fig. 4,22. Range of the classes


```
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                    Estimate / Classification

Y01    Y02    Y03    Y04    Y05    Y06    Y07

Estimate class EKx
            Class              Range
            KL 1               0.6678 — 0.9500
            KL 2               0.0000 — 0.6094
            KL 3               0.7275
            W                  0.0000 — 0.9500
```

Fig. 4.23. Classes of Economic Level- basing on Conditional Factors


```
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                    Estimate / Classification

F01    F02    F03    F04    F05    F06    F07

Result classification
Cl 1 ={ 10; }
Cl 2 ={  1;  6;  7;  9; 11; 12; 16; 17; 18; 19; }
Cl 3 ={  2;  3;  4;  5;  8; 13; 14; 15; 20; }
```

Fig. 4.24. Indicators of Economic development
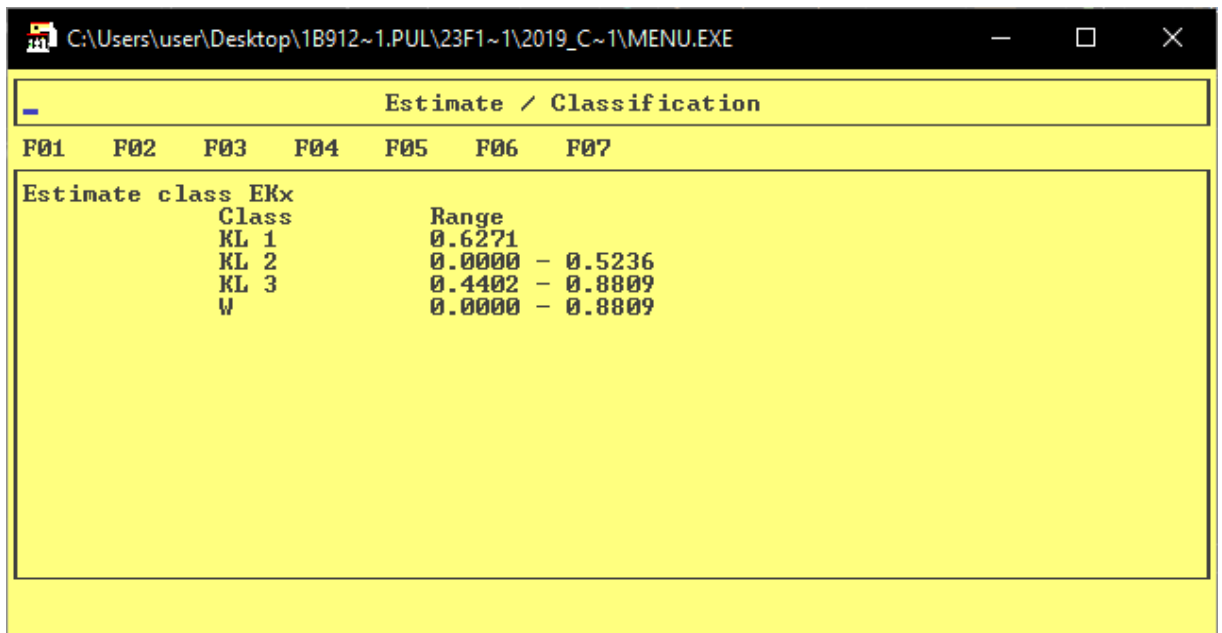
```
C:\Users\user\Desktop\1B912~1.PUL\23F1~1\2019_C~1\MENU.EXE        —   □   ×

                    Estimate / Classification

F01    F02    F03    F04    F05    F06    F07

Estimate districts EA
            EA   1  = 0.0000
            EA   2  = 0.4402
            EA   3  = 0.8303
            EA   4  = 0.8809
            EA   5  = 0.8568
            EA   6  = 0.0908
            EA   7  = 0.3835
            EA   8  = 0.4745
            EA   9  = 0.4041
            EA  10  = 0.6271
            EA  11  = 0.2948
            EA  12  = 0.4660
            EA  13  = 0.4944
            EA  14  = 0.6769
            EA  15  = 0.7038
            EA  16  = 0.2473
```

Fig. 4.25.

```
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                    Estimate / Classification

F01    F02    F03    F04    F05    F06    F07

Estimate districts EA c.d.
            EA  17  = 0.5236
            EA  18  = 0.4338
            EA  19  = 0.5227
            EA  20  = 0.8538
```

Fig. 4.26. Range of classes

4.8 Summation

1.The MBF conception within DSD and COC systems integrates all Conditional Factors and Decisive Features determine the development level of the companies and provides the results in relation to each other – MBF-DSD-COC.

2. The integration of the 4 companies activities is an important component that is be implemented methodically and practically in this research.

3. The application of the MBF allows the decision maker to manage successfully with the complexity of organization all activities in the 4 companies.

4. As part of the proposed system, in this study, the decision-maker may use the so-called "Ladders of management", where digitization of companies has made its management with MPF more flexible. Therefore the functionality of the company with a new youthful image of "ladder of management" will be the main component of enterprise management in the 21st century, instead of discussing the problem of innovation with pseudo-experts during the meeting.

And this confirms the usefulness of **my historic visit** to participate in the board meeting of this company, when at the meeting they were looking for a method of modernizing the organization in this company, where the gathered people seemed to be experts on the way to modernize the company.

The proposal conception in this research within the supporting system to measure, assess and manage the Technical and Economic levels of the companies stands as a practical confirmation for the theoretic chosen in TN with confirmation of choosing three companies which obtained different level of development to be checked with controlling.

<u>In the end I want to add, a company gain the lead over its competitors, must remember that it is not important who produces a lot of goods, but who has a large order for his products (see the following figure).</u>
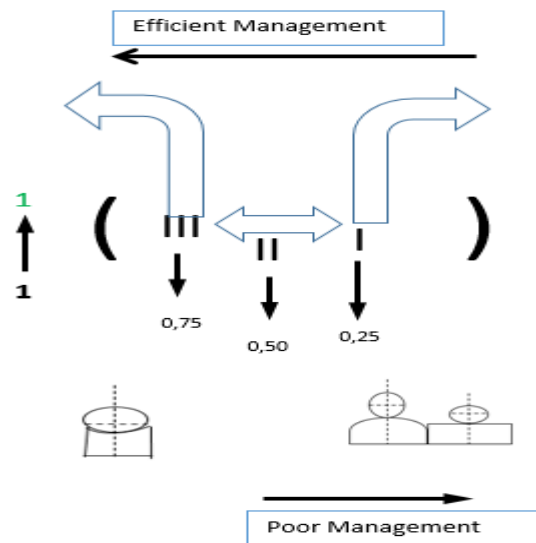
Fig.4.27

The indicators (fig.4.27) of the development level according to groups of individual's states of their levels as follow:

1. state to 0,24 (*unstable state*, that is not likely to fail and not to improve),

2. state 0,49 (*un stabilized state*, that is not stabilized yet),

3. *stabilized state* in TN 0,50- 0,75 (stability),

Now it is the time to look forward to improve the controlling with the Economic Level to select 3 companies (say companies number 1 with poor effect, no. 14 with middle and no. 4 with high level = 0.9500 as in the above figures).

Selection and taking an action in TN.

This creates a new situation in the issues to ensure proper selection action before the complete "fail". This new opportunity to compete with conventional testing methods of effectiveness of selection and creates new opportunities to apply modern techniques of control level of development of the chosen offers in the current time, with a direct computer-assisted. An important issue is the simplicity and ease of use in practice the concept of statistics and multivariate analysis, which are cumbersome in traditional systems. Anyone possessing basic knowledge in this field can easily apply this procedure to his problem.

Therefore the control with "FAM-PSO" provides opportunities for continuous detection the level of development with a proper selection.

Theoretic chosen in TN (copy) with confirmation (original), that are the 3 offers which obtained acceptable level of development by the recipient of the tender and to be discussed and negotiated standards required with the manufacture (offering the tender).

Practical Confirmation- that is the negotiation according to the results obtained by TSS (influence under exploitation) to choose according to real situation.

Practical Confirmation refers to the level of development on the basis of the acceptable standards values for both recipient of the tender and the manufacture.

IV. RESULTS & CONCLUSION

5. THE END

5.1. Results

5.1.1. The utility of the MBF

The effect and the outcome drawn from application MBF method in the operating conditions of Libyan companies was developed on the basis of multidimensional and multi-criteria analysis.

Based on the research material, the author undertakes to prove the rightness of the thesis put forward in the introduction.

Using the MBF-DSD-COC systems, it is possible to classify the analyzed set of companies into homogeneous classes, gathering companies with the smallest dispersion of the variables that characterize them (features, factors, costs, etc.).

In the practical application of these systems, an accurate and reliable selection of features and factors is important. Selection is conditioned on the one hand by a thorough knowledge of company structures and, on the other hand, by a sufficient knowledge of the conditions of their operation.

The presented MBF method aims to find an early warning procedure about the deteriorating state of the organization's level in the enterprise. Hence, the layout of the work and the problems of individual chapters were determined by the purpose of the work - creating an early warning system against deviations ("FAIL") and monitoring on an ongoing basis about the level of business development (STABLE).

Essential for systems designed in the work - the evaluation procedure based on the EX post level of development uses the methods of multidimensional comparative analysis (taxonomy) and multi-criteria assessment of variants (modified Bellinger's method). It is a typical system for business management and monitoring information systems.

In summary, the considerations in this work can be formulated the following conclusions:

1. I proved that the pragmatism character of the MBF method is an effective tool in assessing the level of organization development and, to some extent, it outlines the theoretical problem of assessing the quality of the development level and the level of the simulation problem.

2. The MBF-DSD-COC systems allows the decision maker to freely choose combinations of features and factors from among all the features and factors recognized by the decision maker (director, manager) as important as well as their weight change.

3. The elaboration of the MBF method consists in such organization and management of a company that would provide quick information about the change of conditions inside and outside the company.

4. The proposed method can be a complement to existing control and management systems in companies.

5. The MBF method creates the possibility of developing its own standards in the field of organization in companies.

6. On the basis of monitoring carried out using the MBF method, it is possible to control the development level of companies in time and space, which gives the country the strength of constant development.

7. The preparation of the MBF method consists in such organization and management of the state finances, which would provide quick information about the change of conditions in a given sphere in companies.

8. An extremely important feature of the system depicted in the work is its simplicity. The user does not need to have a thorough knowledge of various statistical methods that require high abilities of abstract thinking, but only use computer programs.

Of course, the doctoral dissertation presented does not solve all the problems that the thesis announces. The solution would require many years of team work consisting of representatives of many scientific disciplines. This would go beyond the author's individual capabilities.

The author of the doctoral dissertation expects that in the further work he will have the opportunity to continue the research undertaken.

5.1.2. Final remarks regarding the use of analysis methods - multidimensional in practice

The presented examples of the assessment based on the Bellinger, Steinhaus, Hellwig, and Pilawski algorithms and the results obtained have been verified in practice. In the course of further research work on these methods, some new problems appeared, requiring further improvements. There is a need to enrich the arsenal of monitoring tools and to assess the internal and external environment of the company, including objective evaluation of facilities, production processes in connection with the expectations of recipients of products.

The procedure of selecting diagnostic parameters (variables) and interpreting the evaluation results were also changed for the needs of the FAM algorithm. These include issues such as:

1. The Steinhaus algorithm has the ability to divide the population into subgroups, limiting itself to stating that the given object belongs to a given subgroup.
2. In the method of clouds (Pilawski), they use the Steinhaus algorithm, the computer counts within each combination the variance for each subset.
3. The most densely subset subset, that is the subset of the smallest variance, whereas the least concentrated is the subset of the greater variance.

4. After finding a combination in which subsets of the smallest variance are present, the computer performs a multi-criteria evaluation for Bellinger's multi-criterial methods.

5. The Steinhaus method is applied as accurately as possible in cases where there is no formulated division criterion (if we want to divide where there is no interval criterion).
6. Bellinger's algorithm should be included in the so-called sums of standardized linear ordering of objects with subjectively declared number of features, ranges of their variability   (oscillations)   and   their   meanings   (weights).
7. The way of specifying in the Bellinger's algorithm the optimum of individual features based on the determination of the range of values considered optimal has been changed in   the   FAM   procedure.
8. The selection of hypothetical variables (stimulants and destimulants) for a given criterion does not have to be linear (as currently assumed by the Bellinger algorithm).

5.1.3. Comments on FAM

The use of the original method in the work to assess the state of functioning of objects differs from the existing methods in the following way:

1. Traditional systems controlled by data and scientific knowledge consist of rigid elements for modification and enrichment of updated knowledge, whereas the FAM method enables us to enrich our knowledge about new phenomena concerning the quality of objects functioning on the basis of supplied combinatorial data,

2. In traditional systems scientific knowledge is incorporated in the process of creating the algorithm, while in the FAM method one can get additional new information as a result of combining two algorithms (Stainhaus and Bellinger),

3. It provides new tools to support traditional quality control methods through the use of measurement results of Steinhaus and Belhnger algorithms,

4. Enables early diagnosis of the deteriorating condition of objects,

5. Is a new proposal to monitor the operational parameters of information support, allowing proper planning and control of the work of facilities,

6. Allows the use of simplified statistical calculations and multidimensional analysis,

7. Allows to present the results of tests in the form of images and graphs, which greatly facilitates their analysis and drawing conclusions,

8. Is an effective method to study new phenomena in order to set standards for operating parameters.

9. The FAM method makes it possible to significantly eliminate subjectivism in assessing and shaping the level of development of objects.

6. List of Figures, Tables & Attachments:

LIST OF TABLES

7. Attachments
Utility of the System DSD: operational functions :
The functions contained in the system form a menu through which the system operates.

Screen 1

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├─────────────────────────────────────────────────────────────────┤
│   C1    Performance   Review/Edition data C1    Factors          │
│                                                                  │
│        1       2      3      4      5      6      7               │
│                                                                  │
│  1     5       6      6      9     30     40     14               │
│  2     4       3      7      7     20     50     14               │
│  3     3       2      6      6     10     60      7               │
│  4     3       1      5      5     10     70      1               │
│  5     1       1      6      3      5     70      1               │
│                                                                  │
│                                                                  │
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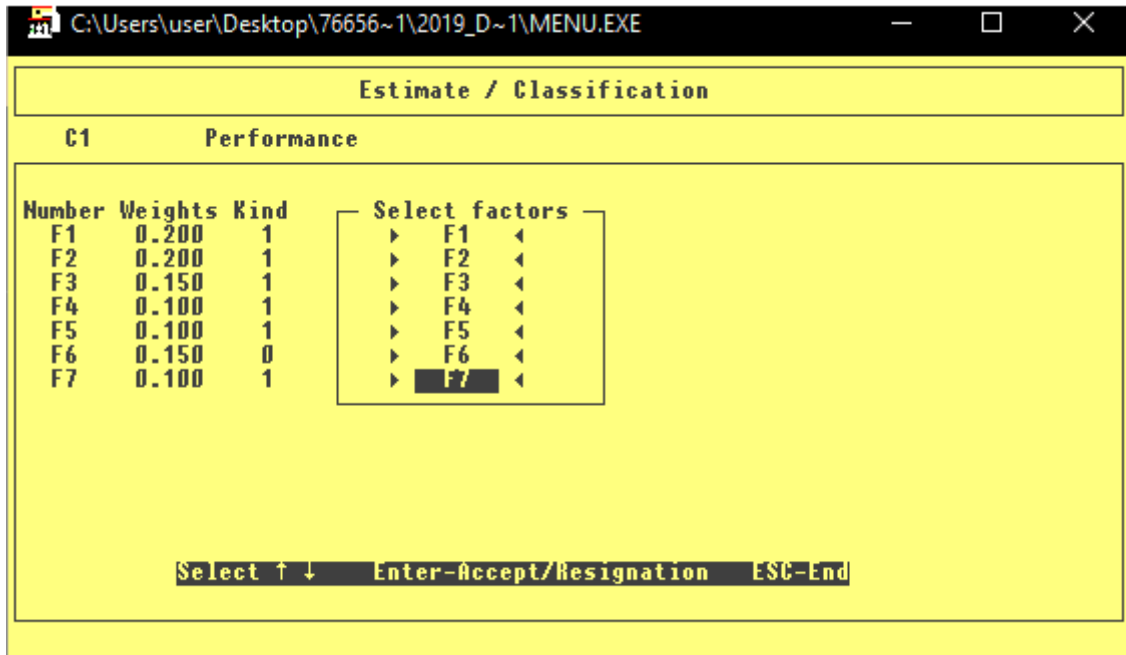
Screen 2

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│            Detection System of Development                       │
│                                                                  │
│   ┌──── Select function ────┐    ┌──────────────────────┐        │
│   │  Select company/level   │    │ Company   C1         │        │
│   │  Review / Edition data  │    │ Level     Performance │       │
│   │      Histograms         │    └──────────────────────┘        │
│   │ Estimate / Classification│                                   │
│   │     Correlation         │    ┌─── Select function ──┐        │
│   │        Quit             │    │     Factors          │        │
│   └─────────────────────────┘    │     Features         │        │
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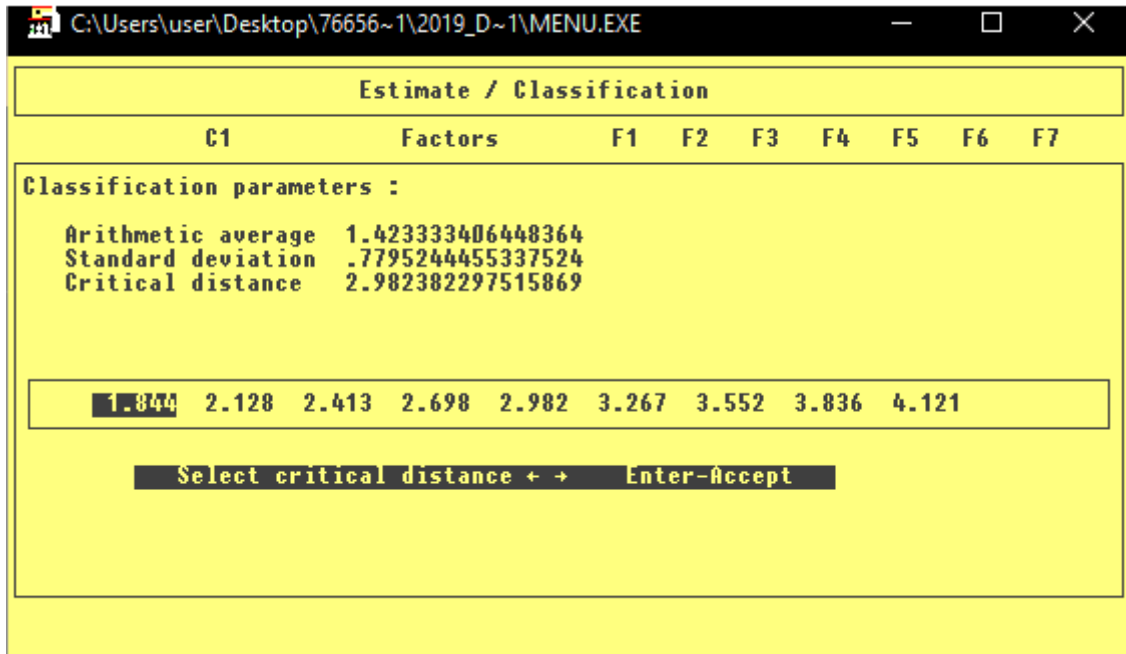
Screen 3

Screen 4
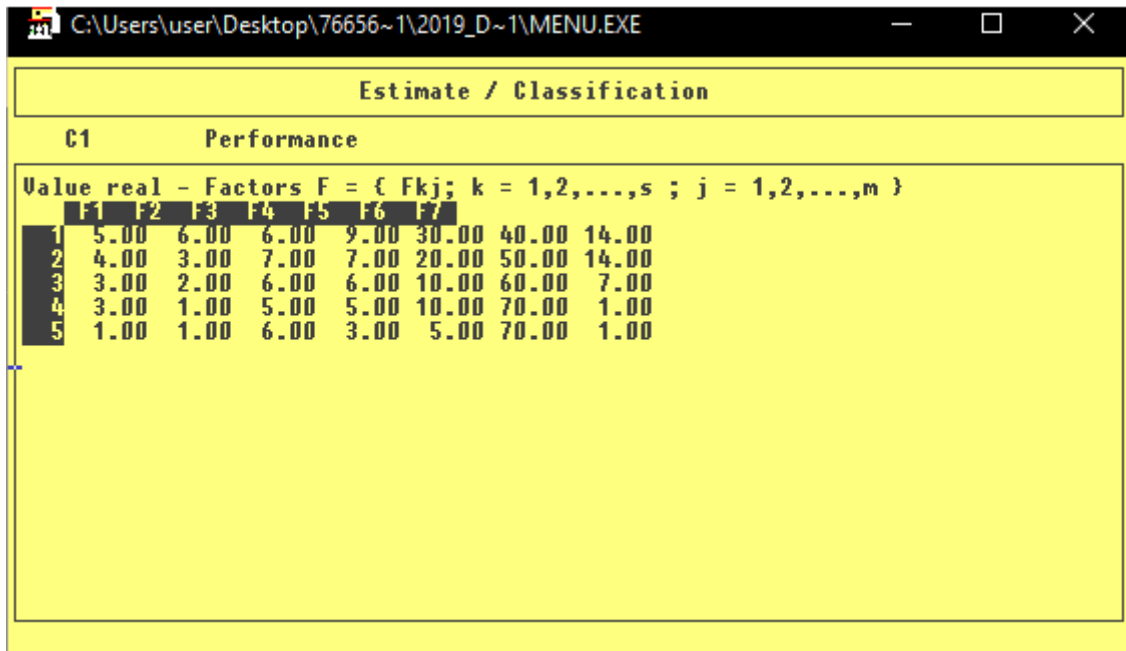
Screen 5

Each class[25] in the system constitutes a consistent group of each companies in the class an present nearly the similar[26]

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[25] According to taxonomy of Wroclaw
[26] Similar presentation the same conditions for oil production (operation of the company

Screen 6

Screen 7

Screen 8

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                        Estimate / Classification
_
            C1              Factors         F1    F2    F3    F4    F5    F6    F7

Estimate class EKx
            Class           Range
            KL 1            0.0750
            KL 2            0.2933
            KL 3            0.6188 - 0.9250
            W               0.0750 - 0.9250
```

Retrospective evaluation by the DSD system

As mentioned before the idea of the retrospection is the action of looking back by the decision maker on the past activities in the companies (2014/20170 to correct the functionality in the chosen company and in the chosen year.
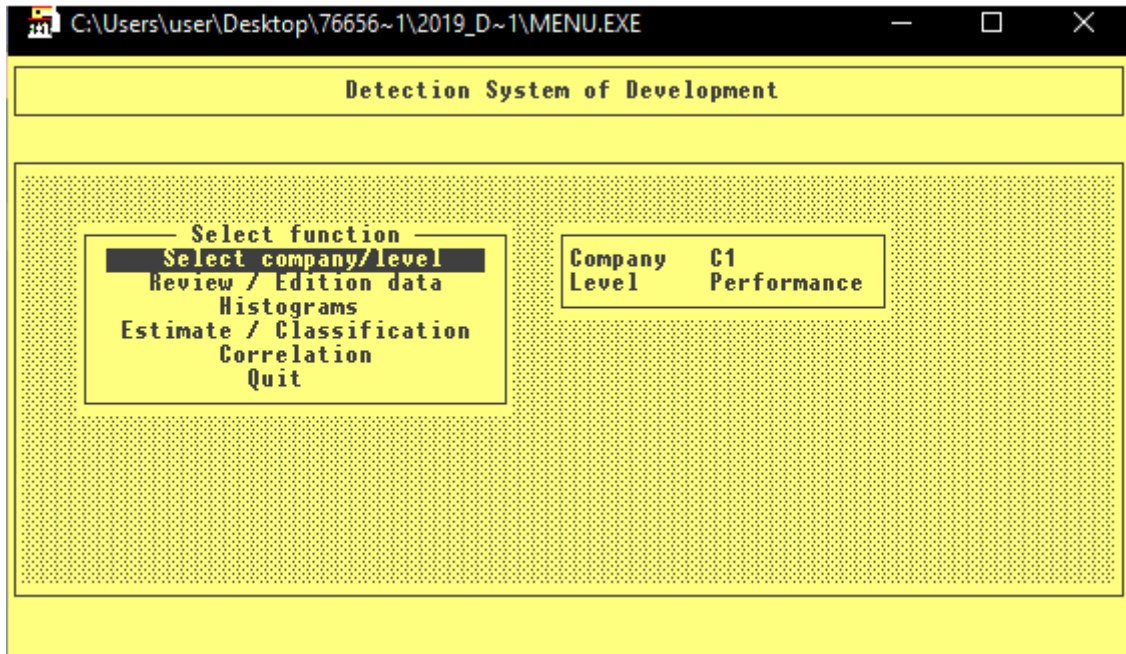
Table 4.9. Development Level calculation for deferent periods- the Companies C1, in DSD

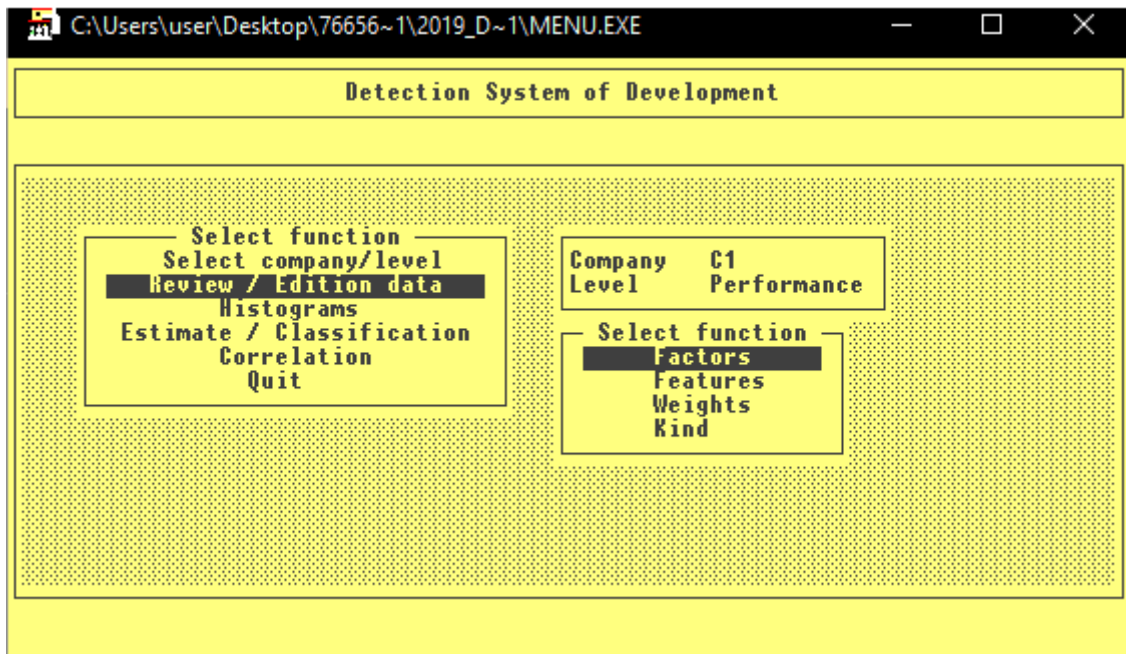| Periods chosen	Symbol in the system	Features							Factors						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
2014/15	1	30	12	3	10	22	10	8	5	6	6	9	30	40	14
2015/16	2	40	14	2	9	23	20	9	4	3	6	7	20	50	14
2016/17	3	43	16	1	13	26	20	10	3	2	6	6	10	60	7
2017/18	4	45	20	1	15	27	30	11	3	1	6	5	10	70	1
2018/19	5	48	21	1	18	30	30	12	1	1	6	3	5	70	1

The lines represent the years 1-2014 / 15, 2-2015 / 16, 3-2016 / 17, 4-2017 / 18, 5-2018-19, respectively. The columns represent the resource numbers respectively: F1, F2, F3, F4, F5, F6, F7 or the features M1,M2,M3,M4,M5,M6 M7.
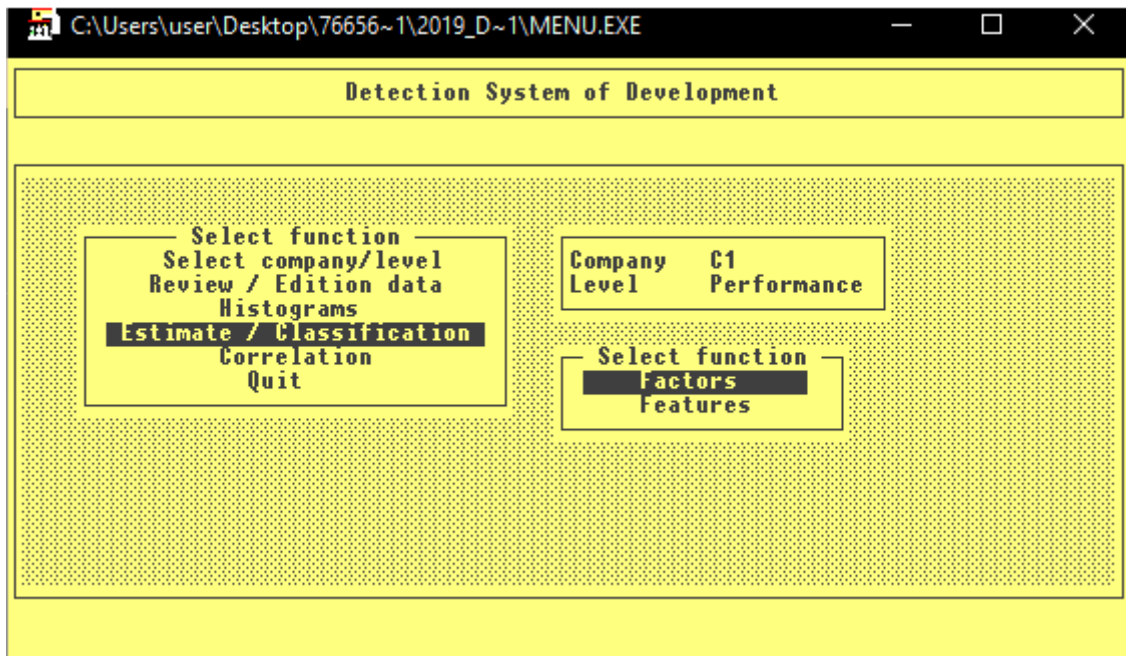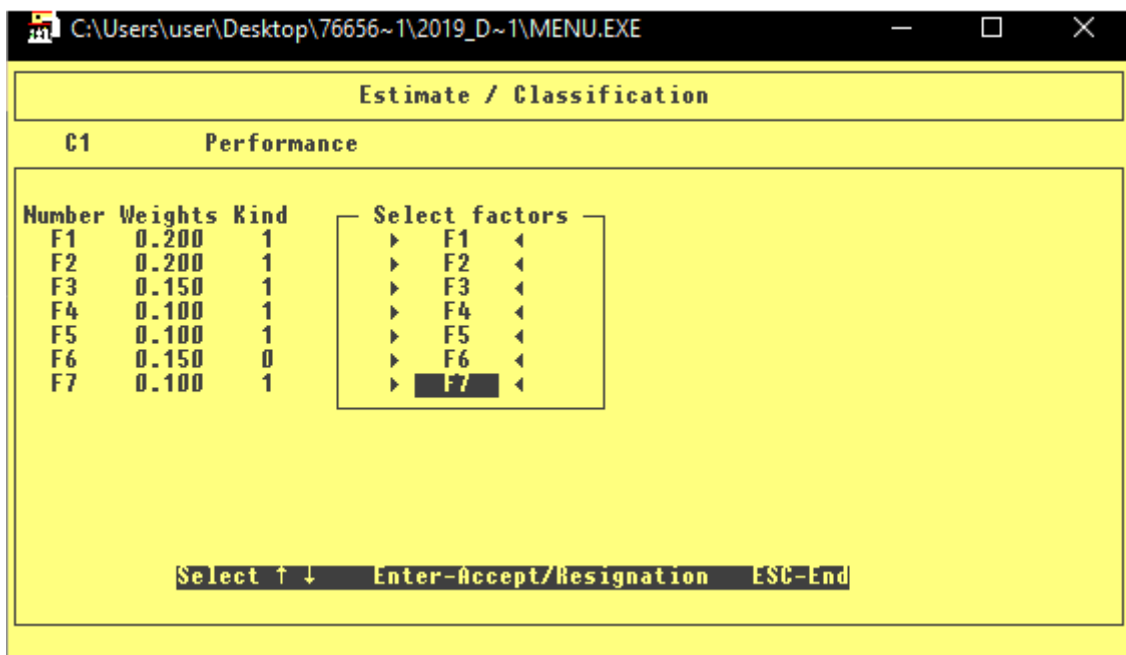
Screen 9

Screen 10

Screen 11

Screen 12

Screen 13

Screen 14


```
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                    Estimate / Classification

            C1              Factors        F1   F2   F3   F4   F5   F6   F7

Result classification
Cl 1 ={   1; }
Cl 2 ={   2; }
Cl 3 ={   3;   4;   5; }
```

Screen 15


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                    Estimate / Classification

            C1              Factors        F1   F2   F3   F4   F5   F6   F7

Estimate districts EA
            EA   1 = 0.0750
            EA   2 = 0.2933
            EA   3 = 0.6188
            EA   4 = 0.8467
            EA   5 = 0.9250
```

Screen 16

```
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                    Estimate / Classification
_
            C1           Factors      F1   F2   F3   F4   F5   F6   F7

Estimate class EKx
            Class        Range
            KL 1         0.0750
            KL 2         0.2933
            KL 3         0.6188 - 0.9250
            W            0.0750 - 0.9250
```

The retrospective views of the companies' activities in the period 2014/2017, and the activities in TN (2017-2018) is useful for a practical predictable results for the companies' activities in the near period 2018/2019.

And as for this period, I predict that it will be the most chronological year of development level (where EA=1 – (see the result) is basing on the past experience gained by the decision maker with the DSD system.

7. Classification and evaluation of oil fields (see chapter 4-4.62)

The task of the "COC" system is the classification of areas on the basis of the factors-features characterizing the "level of similarity" which determine the "level of development" in a given area and in a given time. The implementation of this objective makes grouping (classification) conduct useful for practical purposes and for comparability of areas. Also, using the COC system, it is possible to quantify and determine development indicators.

The system divide the oils areas into four classes such like A, B, C and D according to their positions an situations in the process of development to realize their goals. The classes of qualifications according present the degree's categories of development during the time of activities of the company by the means of their indexes of

development similarities *(**four cases of development**)* to suit the four classes of qualifications A,B,C,D. as below:

1. Neutral development position :

1.1. The same positive position rank of past in time Now,

1.2. The same negative position rank of past time in time Now

3. Forward level (with positive advance than in the past)

4. Backward level (reverse with negative advance).

In order to allocate the companies to the suitable class of qualification either to the advance state of development, regression state or the neutral states. The qualifications is made on the basis of allocation the companies according to the **D**ecisive **F**eatures of the **state** development level, and for the **C**onditional **F**actors of the **similarity** development level.

The decision-maker may be interested in the productivity level of work in the company No. 3 where it obtained a grade level EA = 0.8906, and on the other hand the level of functionality with the low degree level of EA = 0.8303. The same situation applies to company No. 15, with grade level of EA = 0.7819, while the functionality is of EA of low level and equal 0.7038.

By studying tables 1 and 2, the decision-maker can choose various interesting situations and certainly DSD and COC systems help in such choices.

Finally I can say that the proposal systems deal with measuring and evaluation the managerial activities of the performance and productivity in the NOC aim to realize the company's objectives.

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