

# Investigation into the Decision Making Processes within Some Operating Oil & Gas Companies

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**Abstract**—Making decisions is considered as the key role in achieving the desired goals within any organization. Moreover, making decisions in oil & gas industry is becoming a key factor for improving the work performance throughout practicing the most effective tools and techniques. The main purpose of this paper is to identify how individuals making their decisions within operating oil and gas companies.

The required data for this paper were acquired by conducting several interviews with decision makers, and a questionnaire survey was also developed, besides reviewing the related literatures. Decision making processes in Libyan oil & gas operating companies were being investigated. The main findings show that over half of participants always consider safety, security and uncertainty issues when making their decisions, meaning that, it is a good indication of taking precautions when making decisions. Additionally, the majority of participants always double check their information resources, which is also a good indication of increasing the quality decisions and enhancing the work performance. Based on the findings, a number of recommendations were proposed for improving the processes of making proper and effective decisions within this business area

*Index Terms:* Decision Making Process, Decision Maker, Operating oil and gas companies.

## I. INTRODUCTION

The decision making process (DMP) is not an easy task for most decision maker; as it is permeated by some difficulties in the absence of the required information and tools. One of the challenges that confronted DMP is the required time for data analysis to make a proper decision, along with the implementing stages. It has been recognized that lack of coordination and communicating effectively with the staff has impacted on the DMP within any organization.

There are numerous definitions have been adopted, a decision making is considered to be as the process of making a conscious choice between two more rational alternatives in order to select the one that will generate the most desirable benefits relative to unwanted ones [1]. Herbert [2] stated that, the first expert to recognize that decisions are not always made with rationality, describing an administrative model as a decision making model that argues the decision makers, using incomplete and imperfect information, and are constrained by bounded rationality.

Some researchers stated that several engineers and geoscientists do not believe that there is enough time to follow a decision analysis approach, one way to address this concern is to make sure that the process adds value [3]. It was also considered that the DMP is a debatable issue for several Oil and Gas companies, it diverges from a company to another depending on the desired resolution and time needed to achieve targeted goals. Making a decision is a vital and difficult task for the management body [4]. Some common styles that usually practiced for making decisions could include the following [5]:

- 1- Optimizing: helps in selecting the best alternative for decision issue. This style involves, identifying the problem/issue, generating alternative, selecting the best alternative, implementing the best alternative and feedback. This is the ideal method of making a decision, but many times decision makers are constrained because of information availability, time, money, and resources.
- 2- Satisficing: the first satisfactory alternative is chosen rather than the best alternative. The term satisfying was coined by combining the words satisfactory and sufficient. Most of the decision makers tend to follow the satisficing decision strategy.
- 3- Organizational: the decision makers tend to follow the organization policies and procedures to make a decision. The organization view of decision making is primarily based on Standard Operating Procedures (SOPs) or the rule book.
- 4- Political: it is a more authoritarian style of making a decision. The decision makers take the decision as per his/her thought process with or without following any systematic method for decision making.

Some recent surveys from different industries indicated that making use of integrated approach, efficient tools and standard methodologies in decision making process can help individuals and organizations to meet their objectives. Parakash [6] stated that, there is a strong co-relation between processes, people and technology interact for decisions being made.

Effective decision making depends on how manager involves the appropriate individuals with proper ways for solving the issues as group decision. However, there are some disadvantages, for instance, consuming the time and waste the resources in some area.

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Received 15 Jul, 2019; revised 29 Jul, 2019; accepted 29 Aug, 2019.

Available online Aug 31, 2019.

In line with this, it has pointed out that the communication was defined as a process whereby transferring the decision from one to another in the organization. Interruption of decisions or disruption communications tools lead to disrupt the work of the organization, and farinaceous conflict where the decision making system is disrupted and failed [1].

In line with the area of training and education, there was a research [3] stated that in addition to professional training, the industry should encourage academia to better train engineers, particularly undergraduates in DM. Engineering is a DM disciple (called design), but they simply do not train engineers in making decisions. In fact, they spend more time teaching them to manipulate seldom-used mathematical formulas or to write computer programs in arcane languages than we do teaching them to make high-quality decisions. While this is true in all engineering disciplines, it appears to be particularly acute in petroleum engineering. The main role of a Geoscientist, Engineer, or Economist is to support the DM technical work in the oil & gas industry. Companies should ensure the consistent definition and use of uncertainty quantification and DM methods. This can be facilitated through the training of management and professional staff, which will build a level of comfort and familiarity that should both increase and improve the use of the decision analytic methods.

## II. STUDY APPROACH

The sources of collected data are literature review , direct observations, a survey questionnaire and interviews; the direct observations and interviews were used for extracting the required information for this study, whereas the literature review was occurred to support the acquired information and data. A total of 216 hard copies of the developed questionnaire were fully completely returned with a response rate of about 91% from the total distributed copies. As a result, data was analyzed and draw out the conclusions and end up with the recommendation.

The questionnaire contains general information regarding biographies of the participants, and comprised statements; describing how individuals make decisions. Table (1) shows the durations of weighted mean values via different colors which were used to make the interpretation results in a comprehensive way. The red color refers to a very low scale and the dark green refers to the very high scale.

Table 1. Weighted Average Mean Duration Length of the Used Likert Scale.

Scale	1	2	3	4	5
<b>Weighted Average Mean Duration</b>	1.0 to 1.79	1.80 to 2.59	2.60 to 3.39	3.40 to 4.19	4.20 to 5.0
<b>Frequency</b>	Never	Rarely	Sometimes	Often	Always

## III. DATA ANALYSIS & DISCUSSION

Before analyzing the gathered data, a reliability test was conducted for the entire questionnaire. Cronbach’s Alpha was used for testing the internal consistency of the entire questionnaire, it was found to be equal to 0.839, meaning

that the internal constancy of the questionnaire is stable enough to be studied.

### A. Investigation of Participants' General Information:

It was found that the majority of the participants are men, and within age group of less than 46 years old. Besides about half of them are BSc holders, whereas, Master degree holders are in range of 40%; this leads to the availability of qualified decision makers in the participated companies [8]. The diversity in managerial levels of participants are shown in Table (2).

Table 2. Frequency Distribution According to Managerial Levels.

Managerial levels	Manager	Superintendent	Coordinator	Supervisor	Team Leader	Specialist	Senior	Others
<b>Frequency</b>	32	29	42	14	4	23	63	9
<b>%</b>	14.8	13.4	19.4	6.5	1.9	10.6	29.2	4.2

Table (3) shows the participants’ experience in their work place. It was found that about 72% of them are with an experience of more than 10 years that enhancing the confidence in the obtained results in this survey.

Table 3. Respondents’ Experience within their Companies.

Work experience, (Years)	<5	5 to 10	11 to 15	16 to 20	21 to 25	26 to 30	31 to 40	>40
<b>Frequency, %</b>	9.7	18.5	25.5	11.1	10.6	13.4	11.1	0.5

Table (4) shows the participants are with an experience in their current managerial positions. Surprisingly, it was found that around half of them are with an experiences of less than 5 years. Meaning that management changes have been occurring during recent five years.

Table 4. Respondents’ Experience in the Current Position within their Companies.

Work experience in current position, (Years)	<1	1 to 5	6 to 10	11 to 15	16 to 20	21 to 25	26 to 30	>30
<b>Frequency, %</b>	6.9	48.1	26.9	6.0	5.1	2.3	2.8	1.9

### B. Investigating How Individuals Make Decisions:

This part describes how individuals make decisions within their work place. The following Table (5) shows average mean values with a higher percentage value of frequency distribution on each Likert scale for “how the participants are making decisions”. It seems that the majority of participants often use a logical and systematic way when making decisions. It is clear from the two statements (2&3) which have lower mean average values are falling within rarely Likert scale (1.8 to 2.59), meaning that most

participants rarely (make spontaneous decisions, and make important decisions at the last minute). This meaning that the participants think deeply before making a decision and having good decision. Most participants of (29.2%)

sometimes like to have someone to guide them in the right track, this may refer preferring having a group decision.

Table 5. Frequency Distribution of How Individuals making decisin.

Statements	Frequency Level					Mean value (1-5)
	Never	Rarely	Sometimes	Often	Always	
	Frequency, %					
Making decision in a logical and systematic way.	0.5	4.2	16.7	47.2	31.5	4.05
Making spontaneous decisions.	25.5	27.8	28.7	15.3	2.8	2.42
Making important decisions at the last minute.	22.7	25.9	33.3	13.0	5.1	2.52
Working out all pros & cons before making a decision	2.3	2.3	18.1	44.0	33.3	4.04
Using advice of other people in making important decisions.	1.4	5.1	30.1	38.0	25.5	3.81
Following a scientific DMP to make a good decision.	4.6	8.8	35.2	32.4	19.0	3.52
Using experience to make a decision in some cases.	-	1.9	16.2	48.1	33.8	4.14
Taking safety/security issues in my consideration when making a decision.	0.5	0.5	9.3	30.1	59.7	4.48
Taking uncertainties issues in my consideration when making a decision.	6.5	11.1	26.9	36.6	19.0	3.51
Before making a decision, I double check my information sources to be sure I have the right facts.	-	0.5	7.4	31.9	60.2	4.52
When MD, it is more important for me to feel the decision is right than to have a rational reason for it.	5.1	5.1	16.7	40.3	32.9	3.91
When faced with an important decision, I like to have someone steering me in the right direction	9.7	23.1	29.2	28.7	9.3	3.05
When making a decision, prefer making it in short time with less procedures.	15.3	25.9	31.5	20.3	6.5	2.77
When making a decision, I consider various options in terms of a specified and desired goals.	0.5	2.3	22.7	54.6	19.9	3.91
When making a decision, I tend to rely on my intuition.	7.9	31.5	31.5	24.1	5.1	2.87

Around a third of participants of (31.5%) rarely prefer making decisions in short time with less procedures; this leads to have a good indication that most respondents focused again on the quality of the decision regardless of its procedures (although sometimes the urgent and quick decisions should be made within short time, as it may affect the work performance in such critical situations) and sometimes tend to rely on their intuition as shown in statements (12, 13&15). Over half of participants always consider the safety, security and uncertainty issues when making decisions as shown in statements (8&9), meaning that it is a good indication of taking precautions when making decisions.

#### IV. CONCLUSIONS

The main conclusions could be briefly summarized in the following points:

- The majority of participants sometimes make good decisions by following a scientific DMP, but apparently not all the time as they follow their past experience in such similar situations, as intuitive decision can be worked well in the areas where a lot of experience took place.
- An inherited system that previous people established (getting other experiences) also used. It gives the impression that all managerial levels often use their experience to make decisions. However there is an individual effort to follow a scientific DMP to make decisions by using different techniques & tools in making their decisions.

- A decision worked out by a group has a greater tendency to be more effective than that of an individual effort. However, most of participants tend to rely on their intuition when making their decisions.
- Most participants always take safety/ security and often uncertainties issues in their considerations when making their decision (Depending on job requirements). Specifically, when it comes to make decisions in developing gas & oil fields as the safety, security & uncertainties issues are considered to be the most priority requirements (these issues are raised in exploration phase as it deals with vague picture of the entire reservoirs and once the field is discovered the uncertainty becomes less significance).
- A group decision is preferred as some participants sometimes would have someone guiding them in the right direction in case of faced with an important decision, whereas other participants rarely make spontaneous and important decisions in the last minutes.

In addition, from the observations, the human factor is considered as the most significant factor that impacting the DMP, and this is relatively true as wells as government policy and country regulations. Establishing a good training programs for developing decision making skills should be adopted for enhancing the quality of making decisions. All in all, decisions depend on the desired decision type and the personality of the decision makers, and end up the decisions follows the organization strategy.

## ACKNOWLEDGMENT

The authors would like to thank and appreciate the participation and support of NOC and all the surveyed Libyan operating oil and gas companies.

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