

Czech University of Life Sciences Prague
Faculty of Economics and Management
Department of Management



Bachelor Thesis

Managerial Decision-Making

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

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BACHELOR THESIS ASSIGNMENT

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Economics and Management

Thesis title

Managerial Decision Making

Objectives of thesis

The thesis aims to search for individual characteristics (formalized) decision-making methods and, put their application constraints (appropriate/inappropriate), apply some selected techniques to actual decision-making tasks in corporate management.

Methodology

The theoretical part of the thesis will be processed in the form of a literature overview providing the current state of knowledge within the topic of the thesis. The literature review will represent the theoretical basis for the subsequent application part of the work, which will use adequate methods to support managerial decision making within the selected task of business practice while observing the maximum possible objectification of the output from the decision process.

The proposed extent of the thesis

40 – 50 pages

Keywords

deterministic decision-making, contradictions, rational choice, choice risk, multi-criteria evaluation.

Recommended information sources

Bazerman, M.H. (2012). Judgment in Managerial Decision Making. Harvard Business School. ISBN-13: 978-1118065709.

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Schneeweiss C. (2003). Distributed Decision Making. Springer; 2nd edition. ISBN-10: 3540402012.

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Declaration

I declare that I have worked on my bachelor thesis titled "**Managerial Decision-Making Methods in KazMunaiGas**" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break any copyrights.

In Prague on _____

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Managerial Decision-Making Methods: Case study in KazMunaiGas.

Abstract

In modern management, managers are considered to be key factors on the way to success. Managers perform managerial functions as part of their activity. The prosperity of the organization also depends on the quality of managers. A manager is a worker who, on the basis of election, appointment, authorization, establishment or authorization, actively carries out management activities for which he is equipped with the appropriate competences. This is a specific group of workers whose main task is to control the work activities of other employees of the organization and the use of their available resources.

The theoretical part of the bachelor's thesis deals with basic concepts related to decision-making. It explains concepts such as decision-making, discusses the decision-making process and the individual stages of decision-making processes. It evaluates the influence of quality and information on decision-making. It discusses how types of decision-making problems and processes can be broken down. And what role intuition and judgment play in decision-making. individual methods of managerial decision-making and their procedures are explained. The methods include methods of decision-making under AHP method.

The Bachelor thesis is focused on assessment of a right candidate for an assistance position in Sales Department of KazMunaiGas company.

Keywords:

Deterministic decision making, contradictions, rational choice, choice risk.

Manažerské metody rozhodování: Případová studie v KazMunaiGas.

Abstrakt

V moderním managementu jsou manažeři považováni za klíčové faktory na cestě k úspěchu. Manažeři vykonávají manažerské funkce v rámci své činnosti. Prosperita organizace závisí také na kvalitě manažerů. Vedoucím zaměstnancem je pracovník, který na základě volby, jmenování, pověření, zřízení nebo pověření aktivně vykonává řídicí činnost, pro kterou je vybaven odpovídajícími kompetencemi. Jedná se o specifickou skupinu pracovníků, jejichž hlavním úkolem je kontrola pracovních činností ostatních zaměstnanců organizace a využívání jejich dostupných zdrojů.

Teoretická část bakalářské práce se zabývá základními pojmy souvisejícími s rozhodováním. Vysvětluje pojmy jako rozhodování, pojednává o procesu rozhodování a jednotlivých fázích rozhodovacích procesů. Hodnotí vliv kvality a informací na rozhodování. Pojednává o tom, jak lze rozdělit typy rozhodovacích problémů a procesů. A jakou roli hraje při rozhodování intuice a úsudek. jsou vysvětleny jednotlivé způsoby manažerského rozhodování a jejich postupy. Metody zahrnují metody rozhodování podle metody AHP.

Bakalářská práce je zaměřena na posouzení vhodného kandidáta na asistenční pozici v obchodním oddělení společnosti KazMunaiGas.

Klíčová slova:

Deterministické rozhodování, rozpory, racionální volba, riziko volby.

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Introduction

The overload of information that people have to process daily is vast and everyday increasing tasks seem to be very hard to decide on. At the beginning of 20th century, the key characteristics of information was its scarcity (Wamba, 2015) and (Nooraie, 2012). Nowadays, organizations and its success are highly determined by the decisions it makes based on the available opportunities, threats and internal opportunities. Organization and its performance is dependent on internal and external environment. The decisions made by organizations would distinguish which one is more successful (Lyon et al., 2000). Organizations are under massive pressure to make quick decisions and ensure that those decisions would lead to a greater success in selected markets (et., el. Sharma, 2014). Every decision is influenced by so many factors and based on so many perspectives such as: psychological, economics and sociology. However, firms need to consider all available choices to avoid risks and evaluate potential rewards. Decisions making process can be complicated and also easy at the same time. Decision making are driven by either internal (managers) or external (consultants) who are responsible for an organization (Lyon et al., 2000). Nevertheless, when the business environment is unstable the pressure increases on managers and hence organizational performance becomes volatile. Some examples demonstrate the failures of big companies due to their postponing decisions or ignoring the fact that they made a wrong decision, such as Kodak^[1] (Saaty, 2008), as well as some real estate, retailing and other industries where changing environment dictates the direction of a business with the combination of unfavorable conditions that causes firms to fail. Moreover, decisions making processes and environments of every business are not similar. A position of a firm and its business environment may either create more opportunities or challenges in the decision-making processes, and, in some cases, firms are able to control its processes and do the proper decisions while others are not able to get by under certain circumstances.

^[1] The ignorance of new technology and not adapting to changing market needs initiated Kodak's downfall. Kodak invested its funds in acquiring many small companies, depleting the money it could have used to promote the sales of digital cameras.

1 Objectives and Methodology

1.1 Objectives

The main objective of the thesis is to identify the Decision-Making Methods in KazMunaiGas company. The company has got different departments and the author is mainly interested in HR department and selection process of potential employees, who look for job. Hence, the HR department follows internal rules and driven by certain values according to which, the selection process is run.

1.2 Methodology

The bachelor thesis consists of two parts, theoretical part which is processed on a literature review, gathered from books, professional literature and internet sources which are directly linked with the complexity of the given topic. The theoretical part describes the methods which evaluate and help managers to pick and choose the right solution in a certain case, evaluate the risks and alternative options as well. Additionally, the theory also describes the tasks of managers, management styles and decision – making processes.

The practical part, however, is based on the three different methods, which might eventually help to the decision-making process, those methods are:

- **Saaty Matrix**
- **ANP – Analytic Network Process**
- **Scoring Method.**
- **Fuller’s Method.**

With the help of HR department, the author would apply the mentioned methods within a selection process of workers and evaluate it accordingly. However, HR department of KazMunaiGas is able to determine the criteria based on which, the selection process will be made.

2 Theoretical Part

In this chapter, the author covers the literature review of different authors which help to identify the concept of decision-making processes, why it is important and how management and executives view that phenomena. The author also covers the types of the decision-making processes, its techniques and outcomes. Further, the author covers the methods which are applied by companies, and those methods will be applied as a part of practical research.

2.1 Definition of decision making

Decision making process was perfectly defined by Mintzberg (1973) as a “commitment to action”. It can also be described as a process of making an intentional and well-informed choice (Marakas, 2003) between alternative choices which are available.

Paradice (1991) claims that “Decision making” is the product of intellectual processes which result in the selection of a course of action between numerous options, which eventually lead to a final decision. It is considered to be as an essential part of management and its decision methods are applied in every department of organization, at all levels, often taken in cases of uncertainties, conflicting objectives and value preference and risk attitude. The most important skill of a good manager to quickly react on internal consequences and make quick decisions without hesitation, however, it is the hardest and very dangerous process for a firm, which might lead a firm to its failure. Marakas (2003) claimed that inaccurate information and data causes managers and executives to hesitate and delay their decisions which costs millions of dollars. The biggest challenge for a firm remains the same and it is to find the proper time and analyze it fast enough to make a qualitative decision.

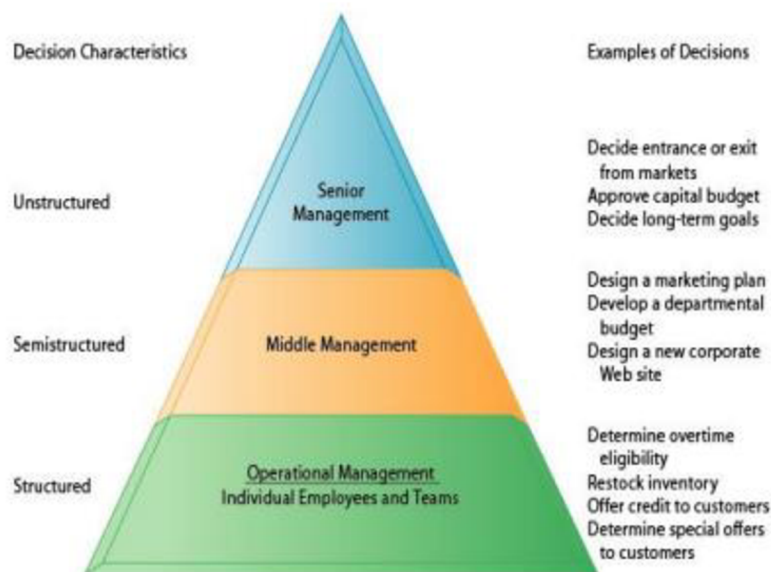
Nowadays, decision makers are expected to make fast and effective decisions with a limited time and without much of a support, among a massive amount of information. As the complexity and overload of information makes it harder to make a decision, the issue of developing decision-making capabilities is still the same challenge for companies (Sharma, 2014).

2.2 Types of decisions

Decisions are made at all levels of firms, from executives to receptionists of a firm daily. It could be considered as a routine and common thing, however, there are decisions which take more time and are very novel and complex. Even though the value of improving any of those decisions seem to be a vast of time and unnecessary, it eventually creates hundreds of thousands of such small decisions which ultimately adds a big value for firms.

Organizations are typically divided into three different categories which are: senior – strategic management, middle management, and operational management. Each of those level is responsible for a certain part and has its own information which might eventually support the common decision, the illustration of such structure is shown in **Figure – 1**.

Figure 1: Structure of a firm and its decisions



Source: Laudon and Laudon (2008)

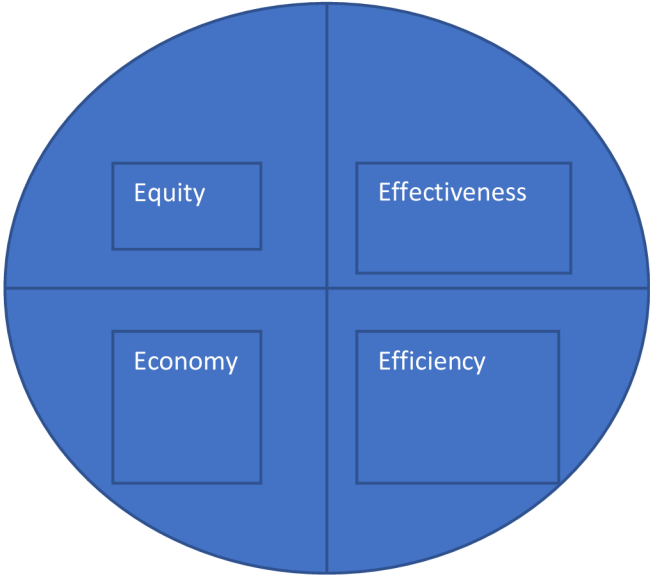
Laudon and Laudon (2008) described decisions such as structured (at the very bottom), semi structured (middle) and unstructured (at the very top) of hierarchy. Unstructured decisions are perceived as novel and complex ones with a higher degree of uncertainty. Such decisions require time, assessment, analysis and forecast on how further solve the problem (Laudon and

Laudon, 2008). Semi – structured decisions are those, which mostly need a human experience and other outside factors to make a decision, for example (HR department and hiring processes, which is the example of the author’s research in this thesis). Structured decisions are the ones which are made daily. It is usually the decisions which are known and repetitive (approving invoices for payments in the workflow), it is done with one click, very efficiently and properly.

Associations of such decisions are usually assigned to a certain type of management. For example, the operational management deals with thousands of decisions which are repetitive and have routine flow, predefined outcome and easy to handle. The tactical management deals with the semi-structured decisions, when a problem has a certain solution and hence, the unstructured decisions usually appear in the strategical management with thousands of decisions, which have a high level of uncertainty and unpredicted outcome.

Every manager should always consider the law of 4 – E, its effectiveness, efficiency, economy and equity. Basically, meaning that every manager should consider its decisions from four different perspectives.

Figure 2: Four E's



Source: Own processing, adopted from (Marakas, G., 2003).

2.3 Managerial functions

Every manager or senior employee uses the typical tasks (activities) of a manager when performing their profession and work in order to succeed - they are called managerial functions. They must use these functions in such a way that they are balanced, since the use of only one of them would not be effective (Marakas, G., 2003). Among the founders of management theory is Henri Fayol, who was also the first to recognize managerial functions and included planning, organizing, commanding, coordinating and controlling in them (Nooraie, M., 2012). These functions can be described as sequential, as they are performed sequentially. However, it may happen that these activities may partially overlap.

Figure 3: Cycle of managerial functions



Source: Adopted from (managementstudyhq, 2022).

Planning:

It is a decision-making process – it can include the formation of plans that will coordinate certain activities, the definition of various strategies and goals, as well as the choice of tasks

and priorities. It helps managers to work more efficiently and also reduce uncertainty because they know where they are going. In the main points of planning, we can include goals, procedures, required resources, method of control and evaluation of results (Nooraie, M., 2012). It is recommended that goals be SMART, that is:

- Stimulating – objectives or goals should motivate for their achievement.
- Measurable – the achievement of an objective/ goal should be measurable.
- Acceptable – the objectives and goals should be accepted by its planner and performer.
- Realistic – the reality of achieving the goal.
- Timed – the goals and objectives should be time-framed (Mintzberg, H., 1973).

Organizing:

Managers must organize their work activities, determine the tasks that must be fulfilled and also find people who will fulfill these activities. The organizational structure is understood as a mechanism that serves to coordinate and manage the activity of workers in the organization. It establishes the positions of people in the hierarchy, their powers and responsibilities. Every organization should align with an OSCAR abbreviation, that is: (Paradice, D.B., 1991)

- Objectives - ensuring the organization's goals (goals)
- Specialization – being able to rationally divide work (specialization)
- Coordination – coordination of activities in space and time
- Authority – creation of a certain order (authority)
- Responsibility – certain powers and duties are established (responsibility)

Staffing:

Staffing falls under the management of people, as well as ensuring good working conditions, increasing qualifications, influencing workers for the benefit of the organization, motivating, rewarding, communicating, resolving labor relations and also ensuring safety at work. Personnel provision is also related to this - i.e. in order for a manager to lead people, he must

secure suitable employees with optimal qualifications for a suitable job position. Leadership is based on communication skills within the framework of superiors and subordinates as well as in cooperation.

Directing:

It is mostly understood as part of organizing. It is sometimes referred to as a continuous function, so it is constantly performed. Every group of people in an organization needs mutual coordination to achieve their goals. The essence of coordination is to ensure material, financial, temporal and possibly spatial harmony between the company's individual goals, activities, or individual workers. It takes place at the level of strategic management according to the set rules and strategy, but also at the operational level through sub-plans, meetings and direct management of people (Sharma, R., Mithas, S. and Kankanhalli, A., 2014).

Controlling:

It brings feedback to the management system and allows to correct plans and strategies, organizational structure, performance, effective use of human, financial or material resources and quality management. It is the monitoring and evaluation of phenomena, situations and processes in the company and its surroundings. The manager performs the inspection himself directly or delegates the inspection to other workers (managementmania.com, 2019).

2.4 Main factors of decisions processes

Capgemini (2004) has structured a list of key factors that should include the whole process of decision making:

- Objectivity
- Setting clear criteria and principles and standing by them
- Consider people's opinion, especially in the field where the final decision is about to be made.
- Personal experience and its contribution which might impact the final decision.

- Familiarity with the concerned business area and own ability confidence.
- Ability to stay under a massive pressure.
- Willingness to take risks and responsibilities.
- Determination to look for a better solution.
- Ability to stick to your decision.

These factors can fully discover firm's capabilities if the management will follow this key instructions and stick to it.

A decision-making issue, or a problem which has at least two possible solutions, is what is meant by the term "decision-making process." The decision-making subject selects one specific solution or alternative based on the provided rules from a variety of options presented by an appropriate system (Papadakis, V, & Barwise, P, 2002). Every decision-making process has two sides: formal-logical and meritorious. The meritorious side relates directly to the substantive side of the problem, which is different for each decision-making method, although the essentially rational side reflects a certain structural solution procedure and is shared by all decision-making difficulties. The selection of the decision-making objective, assessment standards, issue and purpose of the choice, decision-making alternatives, and their effects are some of the fundamental components of the decision-making process (Nutt, P., 2008).

The goal is always a certain state that we want to achieve. It is expressed as maximization, minimization, or achievement of certain values. When setting a quantitative goal, the desired state is expressed numerically, and a qualitative one is described verbally (Nutt, P., 2008)

Evaluation criteria are established to evaluate individual variants from the point of view of achieving the goals - the criteria are therefore derived from the set goals. There are „**Quantitative**“ , see **Figure – 4**, management styles and “**Qualitative**” criteria. Quantitative are easily measurable and clearly defined. However, they cannot always be used – for example, in problems related to employee satisfaction, where qualitative criteria are used more (Mintzberg, H., 2003).

Figure 4: Quantitative vs Qualitative

Quantitative	Qualitative
<ul style="list-style-type: none"> • Countable or measurable, relating to numbers. • Tells how much, how often, or how many. • Fixed and universal, “factual”. • Gathered by measuring and counting things. • Analyzed using statistical analysis. 	<ul style="list-style-type: none"> • Descriptive, relating to words and language. • Describe certain attributes, helps firms to understand the • Subjective and dynamic, open for interaction. • Analyzed by grouping the data into meaningful themes or categories.

Source: Own processing.

An individual or group of individuals who make decisions is referred to as a decision maker (managers). The region of the organizational unit where the problem was identified and where the objective of the solution was established is typically referred to as the object.

Decision-making alternatives refer to potential strategies for achieving the predetermined objectives. Variants may be known in some circumstances, but they must typically be constructed, which takes effort and a creative approach. The predicted effects of each alternative on the decision-making object or its surroundings are represented as consequences (Fotr, 2010).

The state of the world represents risky situations that may occur during the implementation of a given variant of the decision. These risky situations can occur inside the company or its surroundings. They are very important when making decisions under risks and uncertainties, as those are divided into internal and external factors, as well as, controllable and uncontrollable. (Nutt, P., 2008)

2.4.1 Steps of decisions making process

The discrete phases that assist in structuring the provided problem are the stages of the decision-making process. Managerial decision-making is a dynamic process that is impacted by a wide range of variables, such as the organizational environment, skills, knowledge, and motivation (Marakas, G., 2003).

- 1) Outlining the issue
- 2) Problem-solving
- 3) Identification of alternatives and potential modifications
- 4) Assessing alternatives and choosing the best one

2.4.2 The divisions of a decisions making process.

The division of the decision-making process could be based on the following factors, which a manager/executive has evaluated. The **Figure – 5**, illustrates the decisions making outcomes and to what extent it is a manager is in a full control of the situation. Thus, there are three different dimensions where a manager could find themselves.

- **Factors under certainty**

For instances in where the decision-maker is well-equipped with the data they need to make a choice. Decisions are made under the assumption that the manager is certain of the outcome, has sufficient clarity regarding the situation, is aware of the resources and time available for making decisions, is aware of the nature of the problem at hand, is aware of potential solutions to the problem, and is certain of the results of those solutions. In the majority of situations, the remedies are already known from prior occurrences or experiences and are suitable for the current issue. When the stock of commodities falls below and a level is determined, for instance, the choice to record food supply is one that is made under particular circumstances.

- **Factors under uncertain**

There are numerous unknowns and possibilities when situations are uncertain, which makes it difficult to anticipate predicted outcomes for different decision-making options. The management is unable to properly estimate subjective probability for potential scenarios.

Each of the potential issue states makes it impossible for the management to confidently forecast what will happen when this action is taken. It is frequently assumed that the manager lacks knowledge or an intuitive foundation for determining the probability associated with each condition of nature.

The manager, however, was able to address the issue creatively and propose further options. For instance, a flood may provoke fear and an atmosphere of uncertainty among the victims, which influences their ability to make rational decisions. Some people could evacuate their homes and simply take their most vital documents with them, while others who reside in higher ground would wait to see whether the flooding has become worse before deciding what to do next.

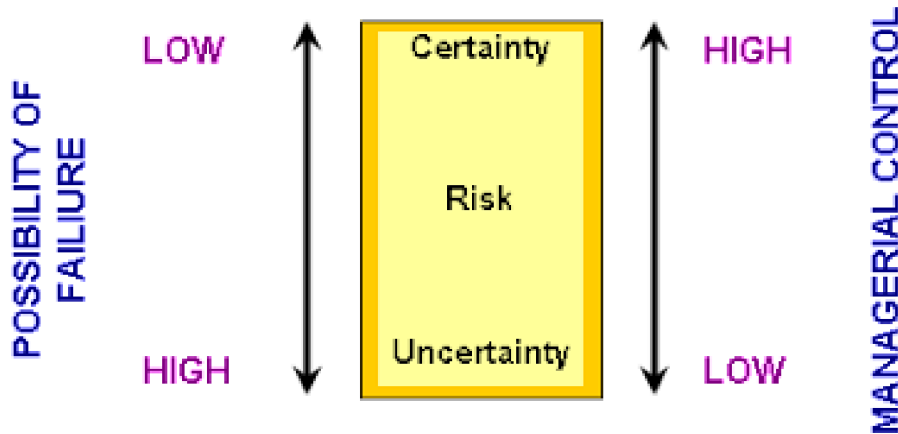
- **Factors under risks**

Due to the nature of future conditions, which are not always known in advance, and the fact that managers encounter this condition more frequently in reality than they do under conditions under certain, conditions under risk provides probabilities regarding expected results for decision-making alternatives. Even while there may be some information accessible, it is insufficient to address all the concerns regarding the results.

The management could outline the nature of the issue, the potential solutions, and the likelihood that each would provide the desired outcomes, but he or she could not promise how each would affect my job. Decision has definite objectives, but the future results of each alternative are random.

The Japanese government had to make a choice on nuclear testing after the Tsunami that struck Japan in 2011 because it was unsure of the extent of the affected area and because the nuclear material itself posed a hazard to human life.

Figure 5: Decisions making under uncertainty, risks and certainty.



Source: Own processing.

2.4.3 Multiple – criteria decision making methods.

Multi-criteria decision-making approaches are used to solve problems involving decision-making when the management must choose between numerous options based on predetermined criteria. There are certain characteristics that almost always define a decision-making situation. The goal is to categorize the variations, identify the best-rated version that meets all stated criteria, and delete the worst-rated, or ineffective, variants. Two categories of multi-criteria decision-making can be distinguished:

- Multi-criteria analysis of variants
- Multi-criteria optimization

The acceptable variations in multi-criteria optimization are determined by a set of requirements that these variants must meet. It is mostly employed when dealing with important judgements, when choosing a methodology to aid in these decision-making processes requires careful consideration. These choices are crucial since they frequently have an impact on the direction of the entire business (Kaliszewski, I., 2016).

Multi-criteria analysis of variants

Multi-criteria variant analysis is frequently used in actual practise. The objective is to turn a benefit out of the values of the criterion. These techniques have the benefit of being universal, straightforward, and low-demand on the decision-maker (Christos, D. and Ortner, R., 2022). Multi-criteria evaluation can be split into the following categories, according to Christos, et al. (2022).

- techniques for calculating criterion weights.
- techniques for evaluating variations across many criteria.

Determining the weights of the criteria is the first starting step of the multi-criteria analysis of variants. Weights determine the importance of individual criteria. The greater the weight of a certain criterion, the more significant the criterion (Fotr et al., 2015). The resulting final solution is significantly influenced by the weighting method. Individual criteria need to be numerically differentiated according to their importance. Weighting is subjective and can be assigned based on many methods. These methods are divided according to whether they provide ordinal or cardinal information.

Ordinal information is based on the order of individual variants, from which it follows that the ordinal information is based on the order of the individual variants, from which it follows which variant appears to be better - e.g., the ranking method or Fuller's method. Cardinal information represents how much one variant is more significant than the other – e.g., scoring method or Saaty's method (Tilo, S., 2015).

Scoring method

From most important to least important, each individual criterion is listed in order and given a corresponding value. The points are then divided by this total after being summed up in the same manner as the scoring system. Once more, the total weights of all criteria must add up to one. The weight v_i of the i -th criteria is determined using the relation if the value b_i is given to the i -th criterion. It serves two main objectives. It is helpful in situations when benefits are hard

to objectively measure, and they may also be used to combine the outcomes of several assessment techniques to offer a comprehensive comparison, whereas the formula looks like this:

Formula 1: Scoring method.

$$v_i = \frac{b_i}{\sum_{i=1}^n b_i}, i = 1, \dots, n$$

- v_i ... criterion weight
- b_i ... point evaluation of the i -th criterion
- n ... number of criteria

Borda Count

This method called something similar to the “Add-’em-up” method, but its actual name comes from the French mathematician who invented it, Jean-Charles de Borda.

With this method, the judges’ raw scores are converted into ranks. This conversion shows the order that each judge has the participating ensembles in rather than simple point totals. These ranks are then added together and the participant with the lowest total gets first, the second lowest gets second, and so on. Ties are typically broken by total Raw Scores first, then from a specific order of captions that is predetermined by the contest directors.

Figure 6: Borda count method.

	X	Y	Z
A	3	2	1
B	2	3	1
C	1	2	3
Total points	$3n_a + 2n_b + n_c$	$2n_a + 3n_b + 2n_c$	$n_a + n_b + 3n_c$

Source: (Ryo, I. and Kazumasa, O., 2017)

AHP method or Saaty's method

With this method, we determine both the preference of pairs of criteria (i.e. the choice of the more preferred criterion) and the size of the given preference. To express its size, Saaty chose a point scale, which is described in the following Table – 1. (Saaty, T. L., 2008)

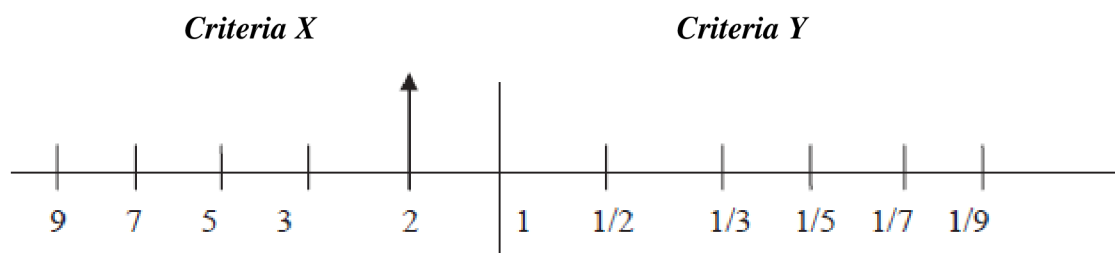
Table 1: Saaty's method – ANP

Point	Description of a point
1	Indicates an equality between two factors
3	The first criteria is slightly better off than the second
5	The first criteria is important than the second one.
7	The first criteria is very strongly more important than the second
9	The first criterion is absolutely more important than the second.
2,4,6,8	When compromise is needed.

Source: Own processing.

There is a pair – way comparison of the when comparing two different criteria. First, the decision maker should prefer, what is the most valuable criteria for him, out of two, and compare each one of them. An illustration is seen below, how the criteria look like:

Figure 7: Comparison of different criteria



Quantitative hierarchical decision-making techniques are a significant component of management expertise. Today, there is a growing emphasis on analytical and quantitative methods as many managers want to avoid making crucial decisions based just on gut instinct or emotion. The approach of the Analytical Hierarchy Process is a helpful tool for making

decisions (Brunelli, 2014). By developing a hierarchical structure of a specific problem, the Analytic hierarchy process technique may be seen as the breakdown of a complicated situation into smaller elements. Saaty's approach is used at each level of the hierarchical structure. Quantitative attributes are given to individual components to indicate their relative importance.

The first step is to build the hierarchy's first level, which serves as the evaluation analysis's aim. The second level, which will contain the primary criteria, and the third level, which is referred to as a collection of alternatives for solving the given problem, must then be determined. If the decision-making task is more challenging, the hierarchy can be broken down into four tiers. There are sub-criteria that fall between the level of criteria and the level of variations. According to (Brunelli, M., 2014) The hierarchy's components are all related to one another. The hierarchical structure becomes more branching the more difficult the decision-making challenge is. Three layers make up the hierarchical structure in the examination of a straightforward problem. The weights are then determined, most frequently using the Saaty technique. In the literature, this is frequently referred to as a quantitative pairwise comparison. The basic idea behind this approach is to analyze pairs of criteria using the so-called Saaty matrix.

The application of Saaty's method in the evaluation of variants in the AHP method is similar to the application in the determination of criteria weights using this method. However, the subject of comparison is not criteria, but variants (Saaty, T.L., 1982). This method is explained in more detail in the chapter.

The final evaluation of variants is determined according to the following relationship:

$$H^j = \sum_{i=1}^n v_i \cdot u_i^j, j = 1, 2, \dots, m$$

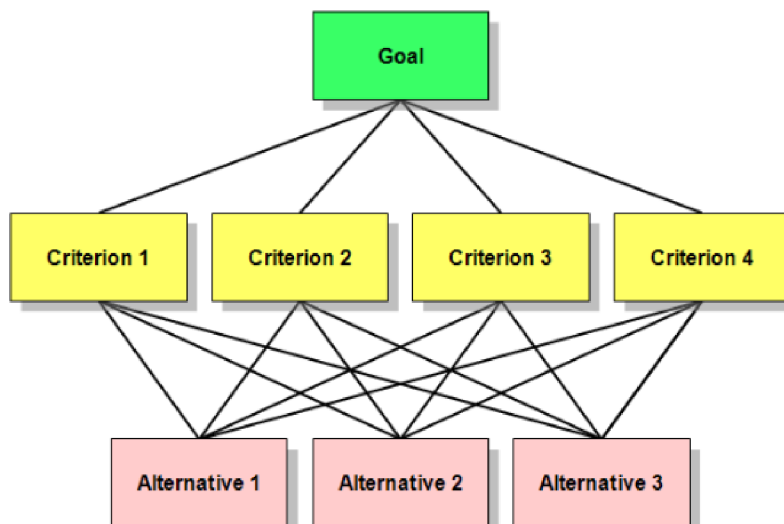
Where:

- H_j ... is the overall evaluation of the j-th variant
- v_i ... the weight of the i-th criterion

- u^{ij} ... partial evaluation of the j-th variant with respect to the i-th criterion
- n ... number of evaluation criteria
- m ... number of variants

The variant with the highest rating is considered the compromise variant (Saaty, T. L., & Vargas, L. G., 2012). The AHP method is elaborated in detail in the practical part of the thesis.

Figure 8: Hierarchical structure of a typical task of multi-criteria analysis of variants



Source: (Saaty, T.L., 1982).

The analytical hierarchy technique offers benefits and drawbacks. Its simplicity of usage by decision-makers may be advantageous. The decision-maker can use a vocal scale to communicate his choices. Another benefit is that this method may be used to address a variety of different decision-making issues. It is also vital to consider the drawback that it necessitates a lot of information.

3 Practical part

This chapter is dedicated to the empirical part, where the author describes the basic information about the bank and its processes. The author, together with an HR Director interviewed few people who applied for a job of “Assistant in Sales”.

A main subsidiary of the holding NC KazMunaiGaz, KazMunaiGas Exploration Production Joint Stock Firm (KMG EP) is a Kazakhstan-based oil and gas company. The title of the enterprise, which is an acronym made up of the phrases Kazakhstan, Munai, and Gaz, gives away what the organization does rather well. The business has been established in 2004 and has its headquarters in Astana, Kazakhstan.

Nearly all Kazakhstan’s oil which is underground is owned by KazMunayGas. The firms represent interests of Republic of Kazakhstan by generating more than a quarter of all oil products (Ibraimova & Chuyev, 2017). More than 44 fields which are located in Atyrau, are labelled under Mangystau, West Katakhsan, Aktobe and Kyzylorda, where most of the NC KMG extracts and produces oil and gas. The company owns its four oil refineries in Pavlodar, South Kazakhstan. Atyrau and Myngyzstau region as well as one of the biggest petrochemical plants in Romania. In its assets, there are also 2,1 thousand of water conduits, 5,5 thousand kilometers of pipelines and 16,8 thousand kilometers of gas transmission systems (Ibraimova and Chuyev, 2017).

Figure 9: Logo of KazMunaiGas



Source: edge.kz (2023).

3.1 The decision-making problem

Due to the recent covid -19, the company had to let its employees go, because of global pandemic. Even though, the main activity of the company is concentrated on the extraction of oil and gas, the company still operates in different sectors of economy, where employees play a major part in its success. As a result, the company had to let 200 employees go. Apparently, it seems to have a short – term decision of the management, which saved money on income expenses, but in a long – run, in costs companies many obstacles such as, to find a new staff who is qualified for a certain job. This particular thesis tries to help HR department in the selection of a right candidate for the position of “Supporting sales”. There were 5 criteria, which HR director chose to be very important for such a job.

During an interview, the HR director asked few questions regarding:

- Expected gross income.

All jobs' salaries in the **Table – 2**, are converted to full-time pay in thousands of KZT (national currency of Kazakhstan) per month.

- Communication skills.

Standard communication abilities refer to your ability to explain oneself clearly. Receiving and processing objections is a function of improved communication skills.

- Type of employment.

Halftime would require the management to choose between hiring two candidates and holding a fresh tender.

- Years of experience.

Experience selling financial goods is a prerequisite for extensive experience. It is seen as having little experience marketing items outside of the banking industry.

- Language spoken.

The job requires at least two different languages in spoken and written formats, Kazakh and Russian, however additional language will be an advantage.

There were **10** people who participated in the interviews personally and online, however the author will not disclose any personal information, due to security reasons and policy of a firm. Thus, the participants will be named as Participant 1, Participant 2, Participant 3 and Participant 4.

The criterion of the expected amount of salary has a minimizing character as well as the language spoken, while the other criteria (i.e. type of employment, experience and communication skills) have a maximizing character. The table below shows the values of the individual criteria, the determined hypothetical ideal variants that express the best values of those offered.

Table 2: Participants and criteria

Criteria	Participant 1	Participant 2	Participant 3	Participant 4
Gross Salary in KZT	140th	170th	210th	170th
Years of experience	2	3	2	4
Type of Employment	Half	Full	Flexible	Full
Communication skills	Middle	Max	Max	Middle
Languages spoken	4	2	2	2

Source: Own processing, based on the selection criteria.

The next table represents the ideal or (best option) out of all and the worst option out of all. See, **Table – 3**.

Table 3: The ideal (best) option and (worst) option

Criteria	Participant 1	Participant 2	Participant 3	Participant 4	Best option	Worst option
Gross Salary in KZT	140th	170th	210th	170th	140	270 th
Years of experience	2	3	2	4	4	2
Type of Employment	Half	Full	Flexible	Full	Full	Half
Communication skills	Middle	Max	Max	Middle	Max	Middle
Languages spoken	4	2	2	2	4	2

Source: Own processing. Excel Software.

The first step is to translate qualitative attributes into numeric values. These entail assigning points to the criteria, such as the type of employment, years of experience, and communication skills. The point system was set at 1 to 10, with 1 being the lowest rating and 10 denoting the highest.

Table 4: Quantitative and Qualitative characteristics

Criteria	Participant 1	Participant 2	Participant 3	Participant 4	Level of importance
Gross Salary in KZT	140th	170th	210th	170th	Min
Years of experience	3	7	3	10	Max
Type of Employment	3	10	5	10	Max
Communication skills	5	10	10	5	Max
Languages spoken	3	7	7	7	Min

Source: Own processing. Excel Software.

The highest rate of all was the type of employment, which was rated as highly important – 10, together with the years of experience and communications skills. The rest of the criteria (Gross Salary in KZT and the Languages spoken) was assigned as less relevant. Each participant was rated based on such assessment.

3.2 Choosing a compromise option

In this chapter, the author and HR director calculated on the base of AHP method (Saaty’s method) to make a decision on each criterion that was assigned to each participant.

Furthermore, Saaty's technique dictates that each criterion must be evaluated independently for each unique version (the last level of the hierarchy). The geometric mean and normalization are used in the tables below to accomplish this. By dividing the geometric mean's value by the total of all means for each variant, normalization is achieved. Each normalization value is then multiplied by the provided criterion's weight, the process is fully described in the chapter 2.4.3.

Table 5: Prioritization matrix for selection process

Prioritization Matrix	Gross Salary	Years of experience	Type of Employment	Communication skills	Languages spoken	Overall evaluation
Gross Salary	1	0,142857	0,111111	0,2	7	0,093
Years of experience	7	1	1	7	3	0,352
Type of Employment	9	1	1	5	7	0,375
Communication skills	5	0,142857	0,2	1	5	0,131
Languages spoken	0,142857	0,333333	0,142857	0,2	1	0,050

Source: Own processing. Excel Software.

Based on the criteria chosen by HR director of KazMunaiGas, the highest priority seems to be the “Type of employment” preferably, it should be full – time candidate.

The next matrix will demonstrate the evaluation of criteria among all participants and the final result will be concluded in the Chapter – 5, “Conclusion”.

Table 6: Gross Salary Assessment

Gross Salary	Participant 1	Participant 2	Participant 3	Participant 4	Overall evaluation
Participant 1	1	7	9	5	0,654
Participant 2	0,142857	1	3	0,333333	0,106
Participant 3	0,111111	0,333333	1	0,333333	0,055
Participant 4	0,2	3	3	1	0,185

Source: Own processing. Excel Software.

Table 7: Years of experience Assessment

Years of experience	Participant 1	Participant 2	Participant 3	Participant 4	Overall evaluation
Participant 1	1	0,14286	1	0,11111	0,055
Participant 2	7	1	7	0,14286	0,277
Participant 3	1	0,14286	1	0,2	0,070
Participant 4	9	7	5	1	0,597

Source: Own processing. Excel Software.

Table 8: Type of employment assessment

Type of Employment	Participant 1	Participant 2	Participant 3	Participant 4	Overall evaluation
Participant 1	1	0,111111	0,2	0,111111	0,038
Participant 2	9	1	9	1	0,448

Participant 3	5	0,111111	1	0,142857	0,095
Participant 4	9	1	7	1	0,419

Source: Own processing. Excel Software.

Table 9: Communication skill assessment

Communication skills	Participant 1	Participant 2	Participant 3	Participant 4	Overall evaluation
Participant 1	1	0,111111	0,111111	0,2	0,038
Participant 2	9	1	1	7	0,431
Participant 3	9	1	1	7	0,431
Participant 4	5	0,142857	0,142857	1	0,100

Source: Own processing. Excel Software.

Table 10: Language spoken assessment.

Languages spoken	Participant 1	Participant 2	Participant 3	Participant 4	Overall evaluation
Participant 1	1	9	9	9	0,750
Participant 2	0,111111	1	1	1	0,083
Participant 3	0,111111	1	1	1	0,083
Participant 4	0,111111	1	1	1	0,083

Source: Own processing. Excel Software.

After assessing all the criteria based on the method of AHP (Saaty's method). The results are the following:

- Gross Salary – *Participant 1*.
- Years of experience – *Participant 4*.

- Type of employment – *Participant 3*.
- Communication skills – *Participant 2,3*.
- Languages spoken – *Participant 1*.

4 Discussion

Based on the criteria that we have gathered with the help of interview method with HR director. The author can certainly see that the criteria rated by the HR Director and its importance has certainly impacted the results of a selection process. With the data that every participant has provided during interviews such as: gross salary expectancy, years of experience, type of employment, communication skills and languages spoken.

Based on these criteria HR director and evaluated which criteria is the most important with the help of AHP method. We have created multiple matrix forms that helped us to calculate the results. Based on those results the author is able to conclude what candidate is better off for a certain. However, based on the importance of facts and prioritizing those facts mainly by HR director the results are the following:

For the Gross Salary, the first participant's expectancy is the lowest, however, the criteria is less important for the HR department. The director rather wants someone who is experienced, looking for a full time position and has a certain set of communicative skills.

Even though, the participants – 1, expects less money for the position, it is not quite a requirement.

The second criteria, with the years of experience, the participants number 4, is favorite, as he/she has got 4 years of experience in such field.

The third criteria that concerned mainly the type of employment is led by participant 2, as he is looking for a full time job, however, the participants 4 also looks for a full time position.

The fourth criteria concerns the communication skills, which is rated also as the second important factor, there are two favorites, the participants number 2 and 3.

The fifth criteria, languages spoken, the participant 4, speaks four different languages, which is a big advantage but still, not that important factor for the HR director.

Lastly, the author plans to show the overall calculation with the Weighting and Score points of Saaty’s method. See, the **Table – 11**.

Table 11: Overall Score of Saaty's matrix

Summary	Gross Salary		Years of experience		Type of Employment		Communication skills		Languages spoken		Final Score
	Weighting	Score	Weighting	Score	Weighting	Score	Weighting	Score	Weighting	Score	
Participant 1	0,093	0,654	0,352	0,055	0,375	0,037	0,131	0,038	0,050	0,750	0,136
Participant 2	0,093	0,106	0,352	0,277	0,375	0,441	0,131	0,431	0,050	0,083	0,333
Participant 3	0,093	0,055	0,352	0,070	0,375	0,110	0,131	0,431	0,050	0,083	0,132
Participant 4	0,093	0,185	0,352	0,597	0,375	0,412	0,131	0,100	0,050	0,083	0,399

Source: Own processing. Excel Software.

The winner, based on all criteria is the participants – 4, with his/her years of experience, the preferred type of employment. The results are strictly based on calculations made by author and might only represent the numeric outcome. However, in reality, some criteria might either be undervalued or overvalued. As a fact, the HR Director of KazMunaiGas is an experienced professional, who might decide whether to rely on the AHP method, or rather rely on personal experience and select absolutely another candidate for a particular job.

The **Graph – 1**, illustrates the strongest sides of all participants of the selection process across all the criteria.

5 Conclusion

The bachelor thesis was devoted to the topic of “Managerial decision making” with the objective to evaluate the best fit of candidate for a Kazakh’s company, KazMunaiGas. The author closely worked with an HR department manager, who eventually evaluated the criteria across matrix, see **Table – 5**.

The HR managers has prioritized different criteria, among 4 participants, such as:

- Gross Salary
- Years of experience
- Type of employment
- Communication skills
- Languages spoken.

The final decision to choose, based on the AHP method was the Participant number 4, as the manager’s preferences were mainly focused on “Type of employment” and “Years of experience”. Those two criteria were found in participant number – 4, hence the result correspond to the final decision of the manager.

Thus, the model proves it-self to be reliable. All calculations were made in Excel file.

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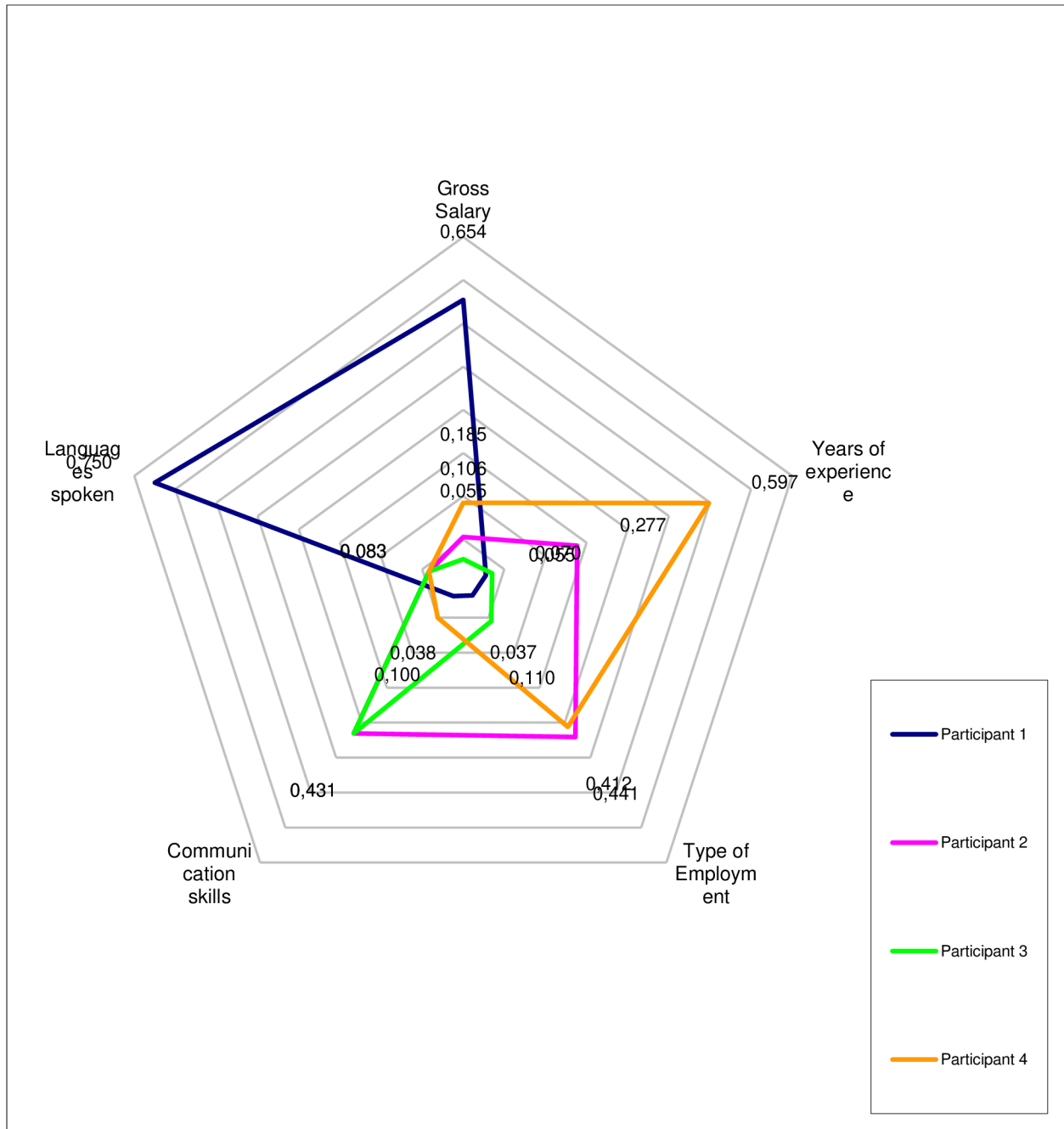
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7 Index

Graph 1: Net of strong sides



Own processing. Excel Software.