

MANAGEMENT ACCOUNTING, AN IMPORTANT SOURCE OF INFORMATION FOR THE DECISIONAL PROCESS IN THE COAL MINING INDUSTRY

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Abstract:

Currently, the evolution of the coal mining industry is marked by a growth in the interdependencies with the surrounding environment, it being conceived as a cybernetic system, reflected both in the „inputs” represented by the production factors, as well as the „outputs” identified in the material goods, works or services through which they are integrated in the national or international environment. To adapt to this new kind of enterprise, the first position is taken by the general informational system, and inside it, by the cost informational system.

For the information on cost accounting to be a basis for substantiating decisions, management accounting must provide certain processing, both structurally and as volume, on the costs taken from financial accounting.

In the case of coal mining extraction the efficiency activity should consider developing a program of measures, which should remember to take into account a series of political and economic objectives - financial environment and current economic conditions of the specific reservoir.

In conclusion, the cost of production is a key indicator in the decisions of the productive units in general, particularly coal mining, the help they provide managers to ensure profitability, competitiveness and enterprise stability.

Key words: management accounting, decision, production cost, coal mining industry, information

JEL classification: M 11, M 41

INTRODUCTION

Management accounting primarily aims to provide factual information to the managerial decision-making aimed at the long-term perspectives on mining enterprise development and current use of resources. In the current market economy, businesses need to act and develop in a more unstable and risky environment. In this respect **management activities** using various information are to be created, provided, analyzed and controlled ever more rigorously, so that enterprises can improve their ability to react to external factors. Thus, **managers** are forced to assume responsibility as optimal browsing pathways for obtaining maximum results with the use of resources increasingly limited and expensive.

DECISIONS AND THEIR ROLE IN MANAGING PRODUCTION

The nature of decisions is overwhelmingly influenced by the quality of information provided and the promptness with which they are transmitted.

Between information and decision there is a relationship of interdependence in the sense that the information are provided to serve management decisions, and they, in turn, once sent to the implementation system, transform themselves into information (1).

The decision is an essential element of the production process because without it, "the company is created, it exists not as an end in itself but only as a means that the manager has available to achieve certain objectives".

The manager's role is precisely "to ensure that the objectives are achieved, the corrections made to work, whenever it" deviates" from the way it has to follow, actually realized through a continuous series of decisions and orders relating to the management organization's efforts toward its ultimate goal."

All activities undertaken by directing unit of the coal mining unit end with decisions to do or not do something, to act or not in one area or another, thus demonstrating that the decision is the essence of management activity in general and production activity in particular.

Analyzed in terms of process management, *decision represents the passage from thought to practice*, which aims to find the most rational way for future action to ensure maximum effectiveness of management actions. The continuing increase in the effectiveness of management requires that any decisions have a solid scientific foundation. From this point of view, **the decision is an expression of a rational act, consistently based on interpretation of information to be processed in order to choose an alternative designed to lead to predetermined objectives.**

Whether the goal is tactical or strategic by nature, that it seeks to influence potential customers and adapt to their claims, whether aimed at enhancing domestic supply and the efficient use of company resources, we can say about the decision that it pursues a course of action, an objective and concrete ways to achieve it. Looking from this point of view, Ovidiu Nicolescu (2) affirms that management decision is "the choice of remedies to achieve objectives through the application of which it's affecting the activity of at least a person other than the decision maker".

Analyzed in terms of coal mining managers, which enables them to attract and combine the resources available to manage the production process, the decision is the main instrument for achieving the objectives set for a given period.

At the level of the coal mining unit, in a decisional situation one can achieve the same goal, using several different options and resources, but asking from the managers a high professional competence and responsibility, both in terms of determining the possible options, their evaluation and selection of the best value and on their consequences.

Alternatives that can achieve the same objective of any one specific features on: the level and structure factors of production allocated, labor productivity, yields and others with the same time, different immediate or future consequences.

Thus in the case of the coal mining units, we encounter a particular situation regarding the conditions under which decisions are taken and their effect over time. In this case, the complexity of risks with the decision-making process is influenced by technical, economic and leadership risks resulting from probabilistic states of struggle with nature, especially that in a large part, the measures indicated in this industry are unique and are irreversible.

Seen from the point of view of long term planning, *the coal mining industry represents a particular case in comparison with other productive branches* because:

- operating activities are determined by the existence of limited reserves, which involves considerable investment enhancement, leading to a very wide horizon of the forecasts, often over a century, due to the time it is expected that full exploitation of the deposit would take place;
- coal reserves are unevenly distributed in the basement;
- exploited deposits are irreproducible, which emphasizes the need for appropriate methods especially regarding technological forecasting. Given that coal natural resources are limited and can be fully depleted at a time, a development in those areas is necessary, some manufacturing industries to ensure continuity of industrial activity are needed;
- the ongoing research and exploitation of reserves, require the permanent investment both to maintain and to develop productive capacities;
- considering that major fixed assets, consisting mainly of mining constructions of high value, have a lifetime projected to that of the mine's life, led to the use of a special depreciation which led indirectly to more than 100 years of regular horizon for the financial forecasts;

Given the *natural conditions* (geological and environmental) that operate coal mines, the manager must use in decision making, various methods and techniques of management that always keep in mind the possibility of unforeseen circumstances.

Special attention is given to *the development of annual plans of operation management*, whose provisions abrogates fairly quickly and are sometimes ineffective work, otherwise very

laborious to draw them, year after year and sometimes quarter by quarter, given waivers or additions to the contract by the beneficiaries.

We also believe that *the problem of mining safety* must occupy a central place in the preparation of forecasts, plans and programs at the level of coal mining, besides the desire to achieve higher production with involvement of lower costs.

To better understand the decision making process, the types of decisions that are taken at a mining company and the types of costs which are used on different levels of decision-making systems, one should know the hierarchy and decision-making powers at each level of such an entity. Thus, at the National Society of Lignite Oltenia (SNLO), we distinguish three decision levels, hierarchically structured as follows:

- **lower level**, consisting of lead mining;
- **average level**, composed of directors of directorates of the central administration: Mining Division, Economic Department, Human Resources Administration Division;
- **upper level**, consists of the leadership of the company: General director (including services administered directly by it: secretariat, department of information, counseling, office director, planning and development departments), the Board of Directors and General Meeting of Shareholders.

Decision-making within S.N.L.O. involves five stages, shown in the figure below (fig.nr.1).

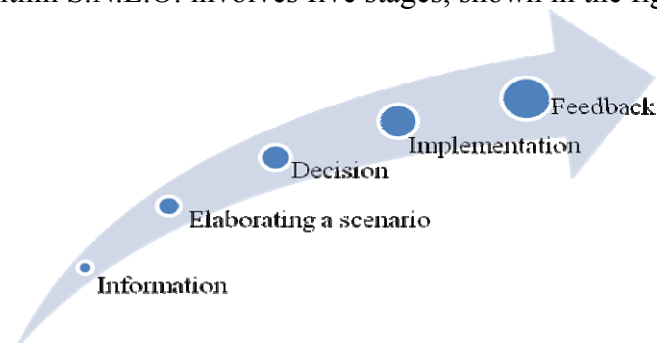


Figure nr.1. Decisional process within the S.N.L.O.

Information and decision are, in the company under study, two closely related concepts in the sense that the decision is the information and decision determines actions, results, thus information.

Under pressure of economic results, company managers, at all levels consider the stage of obtaining information about costs: historical data or estimates.

From **lower level** management of mining companies, we notice that, unlike the environment in which decisions are made by specialized areas of jurisdiction directions, a quarry director must make decisions on all aspects of his unit: technical decisions, financial decisions, decisions with implications for personnel policy, organizational decisions etc.

Usually, it is the quarry's management that deals with decision-making regarding current, largely concrete ways of carrying out the decisions of higher authorities.

For example we present a scenario illustrating the decision process of mining. On 15.03.2011, the Board of Directors decided to increase coal production by 475,000 tons per month for six months, from May 2011. From this quantity one quarry has the amount of mining of 50,000 tons per month.

Receiving this directive, the management's operation will be to decide what action is necessary for compliance. For this the physical condition of existing equipment is very important at the 4 career subordinated and for each exploited state deposit.

In *the phase of information*, directors of mines request from those responsible information concerning:

➤ exploitable potential of each career, namely the current status of each area. Through this information they determine the exact thickness / layers of coal, overburden ratio, estimated reserves, the amount of coal overburden etc.;

- the technical conditions of operation of each quarry: provision of equipment, their physical condition, staff position available;
- each quarry's opportunities to increase production rate, number of shifts, coal storage capacity etc.

On the basis of data furnished by the chiefs of the technical compartments, the management of the unit **formulates a series of scenarios** to be evaluated.

The director of the unit studied, together with technical responsables of each quarry establish 3 scenarios:

- var. 1 - all four quarries of mine to contribute equally to increased production, which means 12,500 tons monthly;
- var. 2 - pits 1 and 3 each provide 17,000 tons / month and quarries 2 and 4 by 8000 tons / month;
- var. 3 - pits 1 and 3 to provide the extra production.

Decision-making stage involves evaluating each scenario and adopting the best solution under the selection criteria.

Analyzing the 3 working variants, the mine management decided that alternative 2 will be implemented, for the following reasons:

1. according to the note report of the technical department, exploitable coal reserve of each quarries is different, and geological conditions are different. These natural conditions determines monthly production rate of each of the four quarries, respectively: quarry 1 (C1) to 35,000 quarry 2 (C2) to 12 000 quarry 3 (C3) to 38,000 quarry 4 (C4) to 16,000. If scenario 1 is adopted as a solution, C2 and C4 quarries would have to double its monthly production and quarries C1 and C3 to increase monthly production by 30%. Scenario 3 would be the wrong choice of the quarry because waste dumps 1 and 3 would be loaded more quickly, which would have required additional work planning.

2. according to background notes prepared by the Finance and Human Resources departments, Scenario 2 is correct inasmuch as it involves the lowest production costs related to additional production. In scenario 1, quarries 2 and 4 would have to support the work by hiring staff, current and capital repairs and planning much earlier than would have resulted in incorrect charging load on the two quarries. Scenario 3 would determine the same high production costs, higher than for scenario 2.

The decision being adopted by career managers and heads of working groups will be followed by its **implementation**. Throughout the implementation its progress will be monitored, any deviations or sudden problems, based on feedback thus obtained, will try to be corrected on the go through the adoption of other decisions. Thus we can say that decision making is a continuous process, a chain of information, deliberation and decisions. The decision process is repeated at the **middle level** as well, indicating that each department has a strict area of competence, decisions being of specialization. The main tasks of the middle echelon decision-making departments are:

➤ **Mining Division** - is responsible for planning and achieving production in the quarries and underground geo-topo activities, investment activities, land and property acquisitions, construction, underground storage, software maintenance (maintenance and repair of equipment to maintain their status operation, to prevent and avoid possible effects of physical and moral wear) and modernization of equipment;

➤ **Economic Department** - is responsible for financial and accounting activities, aimed at registration and record of the monetary value of economic phenomena in society, developing and implementing annual procurement programs, tracking contracts, award contracts works, services and products, management of sales .

➤ **Administrative Human Resources Department** - is responsible for human resources management and administrative activities in the field of general administration(secret documents, secretarial, records, documents, etc.)

Practically, at the "middle management" tactical and current decisions are taken – with a one year time horizon. It is based on their estimates, especially in cases transmitted by the lower hierarchical level. At the median, given its consequences to taking decisions, the cost (in all its forms reporting) becomes very important. This involves making decisions with significant financial implications on the company and assess the impact of measures to be taken on the complete cost and on production, which must be rigorous, fair and take into account all technical and organizational aspects.

Top management (General Meeting of Shareholders) is at the top of the flow of information and has as attributions to (3):

- a) approve a proposed global strategy development, refurbishment, modernization, economic and financial restructuring;
- b) approve the organizational structure and number of positions and establishing normative functional and production departments;
- c) elect the Board of Directors according to Law no. 31/1990 on trading companies, republished with subsequent amendments;
- d) approve the income and expenditure for the next financial year;
- e) approve the balance sheet and profit and loss analysis reports of the Board and auditors, approve the profit distribution law;
- f) act bank borrowing long term, including external sets by the skills and the current bank borrowing, trade credit and guarantees, including pledging according to current laws.

Schematically, the information-decision between the various echelons of the company may be presented as such (fig.no.2).

Conducting an effective management process is conditioned largely by how the leaders pursuing the development of the application of decisions in practice by the performers. To obtain the expected results by the decisions it is necessary to perform a systematic analysis of how to bring out the measures set.

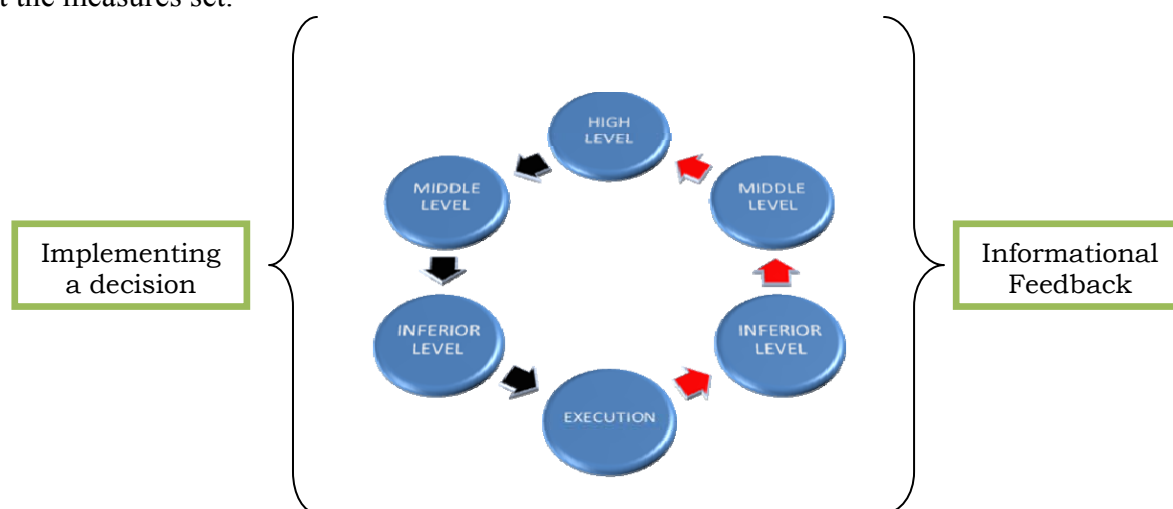


Figure no. 2. Decisional hierarchy of a coal mining company

Control aims at knowledge and analysis of results obtained during the reference period, identifying negative-acting factors or of errors in decision making and their neutralization. By performing a complex timely control, adjustment of the system or subsystem shall be ensured at the parameters initially set.

PRODUCTION COST – BASIC INDICATOR FOR ADOPTING DECSISIONS

Decision making occurs at all levels of the mining organization, taking into account both short-term and long-term perspective. Plans are implemented through decisions whose purpose is

embodied by formulating rational conclusions, derived from financial and quantitative analysis. Thus, management accounting practice is deeply involved in decision making.

An integral part of management accounting in the mining industry is the **information system of cost**. If it is focused on extracted mass mining cost and directed to provide highly detailed information, it supports planning, control and grounding decisions to be applied onto future activities.

In the current economic climate, **costs is the key tool in making decisions on resource allocation (which are often limited), volume and structure of production, increase or withdraw supply of goods or services on the market, etc.** In these circumstances the best solution of choice is the minimum cost. Calculating the cost is not only made overall, but are also taken into account: the cost of distribution, labor costs, cost of education, health, information, administration, time, debt (credit), inflation, unemployment, economic reform, environmental costs etc .

A complex knowledge of costs is the key factor that the manager of an organization can use in making decisions that would have to increase business efficiency. This requires adoption of a suitable computing system, forecasting, tracking and cost control.

For the information of "cost" to be useful to support decision of the management process at the level of mining units, it must meet the following *characteristics* (4):

- *relevance* - information is relevant when it influences the economic decisions of users, helping them evaluate past, present or future events, to confirm or correct their previous evaluations;
- *reliability* - requires that the information on costs should not contain significant errors, and users can trust in it;
- *comprehensibility* - can be excluded because the information on costs is addressed to managers who are deemed to have sufficient knowledge to understand it;
- *comparability* - feature particularly true when analyzing the relationship between actual and pre-calculated costs.

In the case of economic agents operating in the mining industry and especially in the *coal industry*, a new feature would have to be added to take into account environmental costs, knowing that expenditure in this area significantly affects companies' costs.

The following table (table no. 1) presents some of the information provided by the cost information system and their possible use by enterprise management, as follows:

Table no.1. Possibilities of using information of the cost type by the management

Information provided by the cost information system	Possible uses of this information by management
I. Unitary cost of the extracted mining mass	• Decisions on setting the selling price, production planning and cost control; • Decisions on the acquisition or abandonment of property; • Assessment (measurement) and managing performance.
II. The cost of running a shop, a department, etc.	• Decisions on the organizational structure, improving the production and supervision of activity.
III. Wage costs per ton of mining mass or for a period of time	• Planning production, salary policies.
IV. The volume of scrap and technological losses	• Planning production, control of material expenses.

Information provided by the cost information system	Possible uses of this information by management
V.Behavior of costs according to level of activities.	• Estimating profit, decision of "make-or-buy" (outsourcing) and cost; • Decisions on ways to increase the performance of unit.
VI.Cost analysis	• Decisions concerning cost reduction; • Decisions on managing products and clients (maintaining, substituting, eliminating); • Decisions concerning ways of growing performance of the mining unit; • Evaluating effects, measures taken/forecasted by the manager on costs.

Source: Boghean, F. – *Managementul costurilor – curs pentru învățământul la distanță*, Suceava, 2008, p.33.

At the level of a production facility, and therefore the coal mines, the complexity of technology and organizational structure required in their use of *integrated computer systems* that meet all business functions (research and development, production, trade, financial and accounting, personnel) and whose organization must take into account certain general requirements, such as restrictions on the specific activities, how to expand the interface with future systems (open system character), the potential for control from outside the system, the fulfillment of economic and technical principles to ensure compliance with existing regulatory framework and flexibility according to new legislation (5).

CONCLUSIONS

Thus, for the accounting information concerning costs to be the base for substantiating decisions, management accounting must ensure some processing, both structurally and as volume, on the expenses taken from financial accounting.

In the case of coal mining units the efficiency of extraction activities must have in view the elaboration of a program of measures which, besides the factors of influence mentioned, must also take into account a series of political, economic and financial objectives of the current economic environment, as well as specific deposit conditions.

In conclusion, production cost represents a basic indicator in adopting decisions in the productive units in general, and coal mining units in particular, through the help it offers to managers in ensuring profitability, competitiveness and stability of the enterprise.

Thus, having in view those before mentioned aspects concerning production costs, we can say that in the coal mining units, this represents a resulting economic indicator, which expresses the value of used resources for obtaining a ton of mining mass, meant to help in the evaluation of the efficiency of the production activity and to assist the process of taking managerial decisions with the purpose of selecting the most rational leadership variant.

ENDNOTES:

- (1) Iacob, C. - *Sistemul informațional contabil la nivelul firmei*, Tribuna Economică, București, 2000.
- (2) Nicolescu, O. (coord.) - *Management*, Editura Didactică și Pedagogică, București, 1992, p. 10
- (3) HG 103/2004 concerning some measures for the restructuring of production activity of electric and thermic energy on lignite, Appendix 4.
- (4) International Accounting Standards Board – *Standardele Internaționale de raportare Financiară (IFRSs)*, Editura CECCAR, București, 2006, pp. 40-44.
- (5) Dobrin, M. – *Contabilitatea de gestiune și calculația costurilor în industria textilă*, Editura Bren, București, 2004, p. 30.

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