Decision Assistance Informational System - the bases of the organizational management

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Abstract: - The paper proposes to mark out the necessity to create an informational system in order to assist the decision making process in the current framework of the complex information to be instrumented and the speediness of the legislative changes. The on-line reports have an important contribution in the decision management, due to data processing in the very moment it. Storing the data in data warehouses, the association between the priority levels, the utilisation of the new technologies and all the other solutions, put at the SIAD designer’s disposal, allow the creation of a generalised system able to offer almost accurate reports to the users.

Key-Words: - modelling, scientific management, prevision, indicators, Information System for Assisting the Decision, Data Warehouse.

1 Introduction

Starting from the daily realities of the “digital era” dawn, when the on-line businesses are more than a common fact and the letter “e” becomes day after day an usual prefix of the terms that designate economic activities (i.e. e-banking, e-commerce, etc.), the informational management represents, more than a desideratum, a basic condition imposed to the economic organizations for surviving on the market.

The introduction of the informational technologies in the companies’ management and, especially, the inter-active computer assistance, require deep knowledge and efforts for modeling all the processes that take place during the activity of the economic entities.

The concept of modelling an organization activity presumes a systematic approach that allows the identification of all the elements that interact and influence a company.

2 Problem Formulation

2.1 Necessity

Mostly, even at the data summarizing level, the information given by the reporting informational systems are either too much or needs to be up-dated very often to be effective in the decisional process.

For these reasons, the informational applications became needful, in order to play the part of an informational filter and, in the same time, to allow the interpretation of the reports obtained through the informational systems.

An informational system created to assist the decision constitutes an instrument that allows the user to control the decisional process, being capable to offer information about the causes and the potential modalities of solving the problems, based on certain resolution models, analysis models or deducing some additional information based on data aggregation and analysis.

The increasing of the complexity of the processes and phenomena imposed the intensification of the concern about improving the theoretical and practical methods and technologies for conducting them, either at micro-economic or macro-economic level. These concerns are included into a more general science, named scientific management. It is required to create an Information System for Assisting the Decision, due to the complexity of processing the large volume of data to be processed, the legislative modifications and the need to obtain results close to the real ones.

In the data processing field, the client-server systems, used on a large scale, and the tendency of some data base systems to migrate from the relational model to the object model or relational-object, influence either the design modalities or the performances of the systems designed to assist the decision.
Presently, an increased influence is exerted by the increased integration degree of the external data sources and the on-line information, because the relevance of the informational sources available on Internet has increased. It’s possible to classify the decision assistance informational systems taking into account their method used to find the solutions: based on a modeling process or analyzing the data.

The implementation, on a large scale, of the informational technologies in the financial departments of the companies, inevitably led to a relation between the decisional environmental and the informational systems.

Even if, in present, it is not possible to discuss about a generalized use of the support systems for decision assistance, the informational systems clearly influence the quality of the managerial processes of all the organizations, being a competitive advantage that can’t be neglected.

Mostly, the leading activity in a company is reflected by the financial decisions. It can be said that the financial decisions are the key element of the managerial process, because they have direct implications on the financial-patrimonial situation of the company.

The financial decisions are taken through a complex decisional process based on the information given by the informational system of the company and on certain methods and models specific for the financial analysis and diagnostic.

The main decisional fields in the financial-accounting activity can be identified by correlating them with the financial flows of the company, which accompany these decisions.

We can assess that the four most important decisional fields are:
- Financial diagnostic and planning;
- Treasury management;
- Financing decisions;
- Investments.

2.2 Causes

In the context of changes that take place in Europe and all over the world, the integration of the regional economic systems into the continental macro-systems, with all its implications (legislative modifications, currency change, etc.) adds new elements on the long list of challenges that the company which are using informational applications should face.

All these phenomena lead to the methods required for solving the problems regarding the lack of uniformity of the systems used for the financial-accounting activity, deficiency especially felt by the big multinational companies.

2.3. Enunciation

It is justified to realize a generalized system for assisting the decision in the financial-accounting activity, because a generalized system could be implemented irrespectively of the informative systems type used in the company or the ERP system used by the organizations that have already invested in such solution. In order to create such system, we should take into account the stages of establishing the data sources and data extraction modalities.

The approaching of the economic systems, using the diagnostic routine, supposes a specific procedure that integrates the classical approach (based on the causality relations and the inner laws of the phenomena occurrence and evolution) with the systemic approach, studying their coherence in a continuously changing environmental. This approach allows a strict evaluation of the company position correlated with the identification of the weaknesses and the development, being indispensable to underlie the decisions taken by the management.

The concept of normalization in accountancy was born following the necessity of amortization and levelling in accountancy.

According to literature, the normalization process has three fundamental purposes:
- public institutions will obtain homogeneous information;
- users can use the account information, especially the comparisons (time, space);
- better allocation of the financial resources.

The normalization of the accountancy activities materialized in defining some principles and accountancy norms are based on the same terminology for all the factors involved (accountancy information suppliers and users). The accountancy normalization is a very important element for the future development of the informational systems because, by implementing the drawn up standards, it is ensured the comparability of the information in time and space, and the information relevance and credibility increase.
3 Problem Solution

The economic-financial diagnostic is a specific instrument of the managerial activity, which allows us to formulate qualitative and quantitative assessments regarding the conditions, dynamics and perspectives of the respective company. [5]

The management science appeared as respond to the modern society requirements. Different authors presented in different ways the organization management. In the book “The Bases of the Organizational Management”, O. Nicolaescu and I. Verboncu proposed the following definition: “the organization management presupposes the process and the inner management relations, in order to uncover the legislation and principals, which govern them, and to conceive new systems, methods, technologies and ruling methods to obtain, keep and grow the competition”. In the same book, the management process is defined as follows: “in whole, the management process in organization consists of the processes that determine its objectives, the incorporates subsystems, resources and labour processes required to realise them, and the integrated executants that control the staff labour, using a complex of methods and technologies in order to accomplish, as well as possible, the reasons that determined the foundation of the respective organization”.

Henry Fayol affirmed that the management role is to predict, order, coordinate and control the organization activities. These functions have been reformulated by O. Nicolaescu and I. Verboncu, in the above-mentioned book, as follows: “prevision, organization, coordination, training and evaluation-control”. [6]

The prevision function represents “the assembly of the labour processes used to determine the main objectives of the organization and its components, and, in the same time, the resources and the main means required to accomplish them”.

The organisation function is defined as "the assembly of the management processes used to establish and differentiate the physical and intellectual labour processes along with their components (movements, times, operations, works, tasks, etc.), to group them in positions, working teams & departments, and to allocate these ones to the staff, according to certain managerial, economical, technical and social criteria, in order to realise, in the best conditions, the prescribed objectives”.

In the last years, the coordination function consists of “the assembly of the labour processes used to harmonise the decisions and actions of the organisation staff and its subsystems, in the frame of the previsions and the organisational system previously established”.

The training function incorporates "the assembly of the labour processes used to determine the organisation staff and to contribute at the establishing and realisation of the foreseen objectives, taking into account the factors that motivate it”.

The evaluation-control function can be defined as "the assembly of the processes used to measure the performances of the organization, subsystems and their components, and to compare them with the objectives and standards initially established, in order to eliminate deficiencies found and to integrate the positive deviations”.

The realisation of an information system, able to assist the decision, presumes the existence of a software platform to ensure the evolution of the specific applications, but also their maintenance and exploitation. In the literature, this software support is named “support of decision assistance” and its main functions are the management of data, models and knowledge, ensuring also the required connections and the functionality of the user-system interface.

The architecture of a support system used for decision assistance, model inspired from the book “Decision Support and Intelligent Systems” by Efraim Turban and Jaz Aronson, is presented in the following figure: [3]
component of the above scheme, someone can identify new opportunities determined by this real technological revolution.

Because the usage of a software product included in the table processor category can be attacked when realising a generalised decision assistance system, due to the difficulties caused by the impossibility of efficiently handling a large data volume, it’s possible to stock (archives) the data in a relational data base handled by a system for data bases management (SGBD) or even in a data storage.

Another approach used on a large scale, especially in the last years, it’s represented by the orientation of the informational systems for decision assistance toward the data analysis. This option won many adepts, especially thanked to the development of the new technologies: OLAP, Data Warehouse, Data mining.

Practically, these systems are oriented towards transforming data in information and, then, in knowledge, based on data summarizing. This process presumes the data aggregation based on complex criteria and, implicit, the handling of a very large data volume that exceeds the processing capacities offered by the classical solutions. A major inconvenient can be the overload of the data base management system, due to the additional requests afferent to the aggregation operations, which affect the responding time for the current operational transactions. In case of strategic decisions, when the data requirement can extend on longer time periods, this inconvenient can be amplified.

This variant would confer to the system the advantage of a proper management of the data required to detailed analyse consecutive periods of time, free of blocks caused by a too large data volume. In the same time, we can benefit from the advantage of easily realising analysis models and using the specific summarizing and prevision instruments, as support for analysing the specific data for table processing.

The following scheme highlighted the data source, the information to be analyzed, the analysis types required in order to respect the principles and accountancy norms, and the decisions resulting from the respective analyses.

In order to realise a generalized application, the problems arisen from the resources management can appear very frequently and their solving usually needs specific information from the financial-accounting field, respective analyses regarding the profitability, expenses, patrimonial situation, etc. In this case, the calculated indicators are:

- Indicators calculated based on the balance sheet:
  - Net patrimony
  - Working capital
  - Required working capital
  - Net treasury
  - Cash flows

- Indicators calculated based on the financial results:
  - Turnover
  - Commercial margin
  - Exercise production
  - Added value
  - Exploitation gross surplus
  - Self-financing capacity
  - Profit/Losses

The realised SIAD has a high degree of flexibility, allowing the extension of the parameters according to the users’ requirements.

It’s possible to generalize the SIAD, in order to be used by a company, taking into account two dimensions: accounting and time. All the analyses to be performed are using data that refer to a month or 6 months (balance sheets). But, we can’t exclude another given time period. In order to realise such analyses, the data should be stocked and archived,
being possible to be extracted any time. These analyses are realised in the frame of a comparative situation management, when somebody looks for certain indicators, or wants to create different scenarios.

The adoption of pertinent decisions at the managerial level should be based on a complete and correct vision of the company’s financial situation, starting from the study of the economic-financial indicators. These ones represent the fundamental operational instrument of the analysis. We can use dozens of indicators to evaluate the company’s condition and evolution, indicators that may be compared, decomposed or grouped, according to the analysis purpose. The economic-financial analysis can be defined as an interpretation science based on an information system. The pertinent judgements usually depend on the reliability and correctness of the information, but they also depend on the analyst’s knowledge about the economic theory and the objective reality. P. Vernimmen defined the financial analysis as „more an instrument than a theory that allows to judge of the economic-accounting information”.

The development of an informational system able to assist the decision in the framework of data storage implementation shall be divided in some stages. The finalization of each stage depends on the data availability and quality.

In practice, for a good activity development, for each user’s request it can be given a priority level, realising an initial evaluation of the project complexity.

A preliminary architecture shall present, at least, the following elements: the data warehouse, the eventual data marts and the users’ number.

The data warehouse or the eventual data marts shall be defined for each module. It shall be indicated the data base integration mode and ensured that the data marts, if any, are not completely isolated.

For each access instrument, it shall be indicated the number of users and the location of the data warehouse and data marts and, in the same time, the each module user’s location. In order to develop a generalized system, it is practically impossible to indicate the number of users of each component of the system before configuring the application for a certain organization. In the following figure, these values are estimated for a medium-sized company:

As a software solution, we can choose the architecture of Microsoft SQL Server that can be simplified represented by 3 levels:
- Data sources
- Data storage and OLAP server
- Client’s applications.

4 Conclusion

The strategy to develop an information system for decision assistance that includes data warehouse technologies presumes to realize a preliminary plan of the data warehouse and to define an adequate architecture, and then to select the instruments and development environments to be used.

The role of the preliminary plan of the system is to punctuate the priorities of the future users and to incorporate these requirements in the modules of the designed system. Such strategy, of iterative type, will allow the future extension of the data warehouse functionalities, offering flexibility to the system.

The correct, pertinent interpretation of the results is an integrant part of the SIAD design work and development.

The detailed study of the indicators and new technologies, the utilisation and creation of new algorithms capable to generate optimal decisions, will be instrumented in order to create a SIAD for the company S.C. TALC DOLOMITA S.A. HUNEDOARA, whose activity scope is the exploitation, preparation and commercialisation of the products resulted from the talc and dolomite deposits.
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