THE STRATEGY OF IMPLEMENTATION AND INTEGRATION OF THE DECISION SUPPORT SYSTEMS HAVING IN VIEW ACHIEVEMENT OF A PERFORMANT MANAGEMENT AT S.C. ENERGETIC COMPLEX OLTENIA S.A.

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Abstract: The decision support systems (DSS) bring facility in communication and cooperation between managers and the ones providing the required information or the ones executing the adopted alternative. The DDSs it's characterized by flexibility and adaptability to changes taking place in the decision making environment.
In order to carry out an optimum DSS an organizational strategy is needed, through which this system can be created and its operation ensured. DSS integration is the process through which the system is interlinked and can globally communicate at normal parameters with the other technologies and applications within the information system's architecture of the company.

Keywords: organizational strategy, decision support systems, implementing strategy, implementation model, implementation risk, decision support system integration

1. THE CONCEPT OF DECISION SUPPORT SYSTEM

In a competitive economy, the success of a company greatly depends upon the quality of the decision adopted by its managers.

Together with the development of the information systems, decision-making process implies a large amount of information and its complex analysis and synthesis process. This ability of data collecting and processing for the decision making process by far surpassed the human limits, thus the new information technologies were required in the decision making process [1].

The Decision Support Systems - DSS is a collection of information applications, designed and integrated for the decision making process support in management and for supporting the organizational intelligence and knowledge.

Analyzing several studies carried out on the decision support systems, from the specialty literature, the following basic features of DSS can be underlined:

- they are information systems used by managers in order to adopt decisions;
- they are used to support the human factor and not to completely replace it;
- they are used for the structured and unstructured decisions;
- contain (incorporate) database of various categories or sizes;
- contain models for supporting the decision making processes;

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- provide support for the organizational knowledge;
- they are used for the company's intelligence.

The benefits foreseen by using DSS in the decision making systems at company's level are the following: decisions quality, improved communication, cut down costs, higher productivity, time saving, improved client and employees satisfaction [2].

The studies carried out up to present had identified the following reasons for which the large companies begun to develop on a wide scale the DSS:

- the companies develop their activity in an unstable economy;
- difficulties occur when pursuing a multitude of stock selling and buying;
- electronic trade emergence;
- the existing systems don't support decision making processes;
- the informatics department is too busy and cannot address all the managerial needs;
- profitability and efficiency special analyses are required;
- precise information is required;
- new information is required;
- current information is provided;
- cost reduction.

2. THE IMPORTANCE OF A STRATEGY FOR IMPLEMENTING EFFICIENT DECISION SUPPORT SYSTEMS

Implementation is an important stage in the lifecycle of information systems development that can be found in all its analysis, design, and carrying out methodologies. The activities performed within implementing the information systems in these methodologies are grouped according to various criteria, in different sub-stages of phases.

Implementation begins when all the informatics applications of the new system had been individually tested, and the results allow assembling them in a unitary system.

Implementing or commissioning a decision support system is performed at the level of exploitation and it finalizes the design activity of the new system, and it has a fundamental goal to achieve the opportunity status, under the reality conditions in an organization.

Implementation is also considered as the process of bringing a change in, an event that can be associated to the following formulation "When we implement the system..." or "Implementation is following..." [3].

According to Marakas, implementation is a set of activities focusing on the successful introduction of the DSSs into the organizational environment [3].

The way implementation develops will have a significant impact over the manner users would perceive the new system.

An insufficiently prepared implementation, which brings difficulties in exploiting the informatics applications, would give a negative aspect to the whole system. Thus is important for the implementation procedures to be so designed that problems in normal operation of the system to be avoided.

Implementation of a DSS is a complex activity supposing a detailed planning; planning that is the key to a successful operation of the new system.

It would have influence on the way certain people develop their activity and impact on the work relations.

The various implementation strategies have a scientific fundament, but the available options in order for the new system to be operational are debatable.

Just as in the case of other information systems, DSS implementation is not a constant success. It is a continuous process of preparing one entity for the new system, so as to ensure the managerial, financial, technical, human and organizational conditions, required to achieve the operational status and to reach performance within the new system.

DSS implementation is a complex activity because this is not a system for information collecting, memorizing and distribution. A DSS affects firstly the decision making environment. We can say that DSS implementation is a complex process requiring special attention as early as in the stage of designing the system.

DSS implementation requires planning and documenting since the stages of design and elaboration. The context of the system where the implementation will take place has to be analyzed, as well as the organizational culture and users' reaction to change. A successful implementation thus requires an implementation strategy. Along the last three decades, several implementation strategies had been drawn up and proposed.

Cule and other specialists recommended some strategies of preventing failure in the information systems, focusing on the risk identification process and selecting the proper managerial behavior in order to mitigate each risk [4].

Alter had identified four general risk categories for implementation of DSS, each having its own features and restraints set, as shown in Table 1 [5].

Table 1. Strategies for implementing the DSS [5].

Implementation strategy	Typical situation or purpose	Traps encountered
1. Decomposing the project in easily manageable parts	To mitigate the risk of getting a massive system, not operational	Parts integration may be difficult, especially if they are too small
Prototype utilization	A successful effort relatively depends upon the concepts not tested yet. Testing of these concepts is required before extending them at a larger scale	Reactions to a prototype system (in an experimental state) may differ from the reactions on the final system, in current use
Utilization of a evolutionist approach	The implementer tries to shorten feedback duration between system and client and between intentions and products	It requires for the users to be in a continuous change, that some of them would find to be annoying
Carrying out a series of instruments	In order to satisfy the ad-hoc analysis needs by providing small database and models, that can be created, modified and abandoned	Limited applicability. Expenses with maintenance of the data employed having a low frequency
2. Keeping the simplicity in solutions	In order to encourage utilization and avoid users discouragement	Although generally beneficial, it may lead to erroneous representation and use, misunderstanding
To be simple	Is not a problem for the simple systems. For other systems or situations, the choice between simple and complicated approaches is available	Certain problems in the organization are not simple. Insisting on simple solutions situations may occur where the real problems are omitted
To hide complexity	The system is shown as a "black box" that answers questions using procedures that were not presented to the user	Using the "black boxes" by non-experts may lead to a wrong use of the results, due to misunderstanding of models or fundamental suppositions
To avoid change	Given the choice of the existing automated practice or employing new methods, choose formators	The new system may have a low real impact. It is not applicable to the significant efforts of surveying

		the change
3. Acquiring a satisfying support base	One or more components of the user-manager support base is missing	The risk to apply a support increase strategy, without granting proper attention to the others
Obtaining user's participation	The system wasn't initiated by the users. The utilization model is not situated in an obvious advancement	In an environment with many users it's difficult involving all of them and satisfying the needs of all of them. With sophisticated models, a lower feasibility in users getting involved in formulating and interpreting the model
Obtaining user's consent	The system had been carried out without involving the user. The system has to be imposed to the users by the managers	It's difficult to get the consent without any vote, pro or against the demonstration that the system would help the user
Obtaining managerial support	To obtain fundament in project continuation. To obtain managers action by forcing people to indulge with the system or to use it	The manager enthusiasm might not be shared by the users, resulting in a shallow use or even unused
Selling the system	Several potential users had not been involved in carrying out the system and they don't use it	Often with no success, only if convincing advantages can be proven
Satisfying users' needs and institutionalizing the system	A system is efficient by having many users in dynamic applications	Due to the fact that the strategies under this title are somehow incompatible, emphasizing one might result in excluding the other
Providing training	The system is not designed in close cooperation with all potential users	Frequent difficulties in assessing the required training type and intensity. Initial training programs often need substantial re-formation and elaboration.
Providing dynamic assistance	The system is better used by an intermediary than by a decider. The system is used with the help of an intermediary who takes care of the mechanical issues	If the system is used by an intermediary, the decider might not understand the analysis in full detail
Stressing on the mandated utilization	The system is a planning integration and coordination environment. The system intents to facilitate individual work.	A difference between the honest use and the half enthusiastic use of a plan. Difficulty in forcing people to think in a certain manner
Allowing voluntary utilization	Avoiding resistance to construction when a massive selling takes place, by allowing voluntary utilization	Generally inefficient, but efficient though if the system meets an honest need or calls for an individual intellectual user, or the opposite

Leaning upon diffusion and exposure	It's hoped that the enthusiasm will prove the benefits of a system to their colleagues	Inefficient at most may be an excuse for lacking positive action as if a real strategy.
Conceiving the system towards users' abilities	Users differ as their abilities and/or their tendencies in using analytical techniques	Unclear how to do it this way. In practice, the systems seem to be built towards users' requirements and not abilities.

Selecting a strategy is a factor that may have a significant contribution to the project's success. Using a strategy would improve the implementing process but cannot ensure its complete success.

3. FACTORS DETERMINING IMPLEMENTATION

The importance of the implementation issue led to researches extended over several decades, where a series of ideas, theories and many new implementation models for the information systems were found out [2, 6-10]. Most of the authors started to identify the factors that might lead to the success of any information system.

The term of "factor" or "factor of success" refers to an existing condition in entities that contribute to a successful implementation of information systems. The factors of success may be divided into two categories: factors regarding the implementation of any information system and factors that are specific to implementing a DSS.

The main factors of success for implementing a DSS are shown in Figure 1 [11].

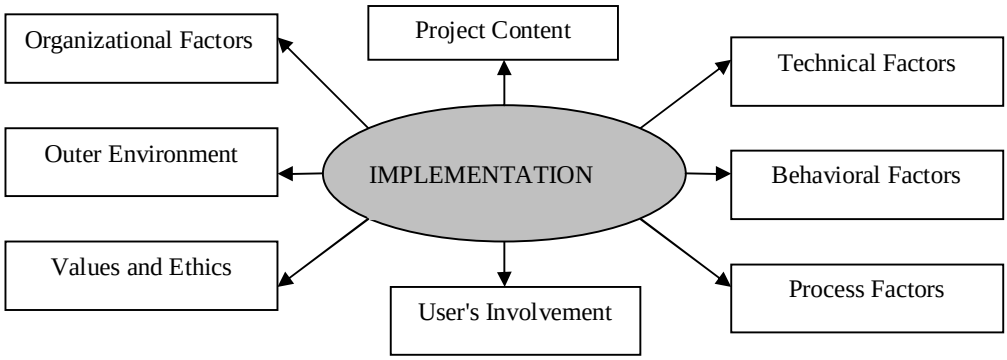


Fig. 1. The factors determining the success of DSS implementation.

The organizational behavior regards the fact that some organizations support using new technologies in the decision making process, whilst others wait, opposing resistance to changes, as well as the fact that organizational expectations may lead to disappointments, as in the case of the first intelligent systems implemented.

For managers the most significant reason for resistance to DSS implementation compared to the transaction processing system, is the concept of change in the decision making system. Managers could be also worried because of the change in activity content, loss of status, power, changed relationships within the entity a.s.o.

Users resistance is a major behavioral factor for DSS development and implementation activity. The concept model developed by Davis explains the fact that users behavior along several generations of information technologies and DSS is very often determined by the user's conscience, by understanding the utility and how effortlessly those can be used [12].

The process factors refer to the manner the development and implementation process is led.

The first aspect refers to the support from the high management, as being one of the most important factors involved in any organizational change, determined by DSS development and implementation. The high management is also the one to ensure financial support for system maintenance and implementation.

Another aspect regards institutionalization as a complex process through which a DSS is incorporated as a self withstanding part in the organization activity, clearly leading to a successful implementation.

Thirdly, the period of time when users used computers and DSS represents a critical factor for the system's success.

User's involvements suppose their participation in the system development process that becomes very important in the testing and improving phase. If taking into account designing and carrying out a DSS, user's participation is recommended along the whole period of development.

The organizational factors look for competence of the DSS development team, resources optimization, organization's politics, connection with the information department in the organization and system compatibility with the company and participants personal interests.

Ethics and values involved in DSS implementation are in entity's management responsibility, which has to decide if the implementation process is ethical or even legal. Even if the developed objectives or processes may be ethical, the possible impact of the implemented process may not be just as ethical.

The outer environment includes social, political and other types of factors that might impact DSS implementation both in a favorable and in a negative way.

Project content refers to its importance for the entity and its members. Most of the factors in this category may be considers as elements facilitating any DSS implementation, as they are independent of any particular project.

Each project has to be assessed according to certain criteria, as the cost-profit ratio, project implementation opportunity and users expectations regarding benefits that might result from using DSS.

4. IMPLEMENTATION MODELS

The Kolb and Frohman model contains seven steps. The essence of the mode is the supposition that a successful implementation would depend upon certain templates of actions, existing among users and analysts.

In an empirical study, Ginzberg applies this model of change in performing a series of hypotheses suggesting a strong relationship between the degree the problems had been successfully solved on each of the seven levels of the model and the general success of the implementation process [13]. Its results indicated that the projects strictly conforming to the Kolb-Frohman norm have a significantly higher degree of success than the projects drifting away from the model.

Table 2 shows the seven phases of the model and a detailed description of activities.

Alter had identified six templates (scenarios) for DSS implementation. These templates differ according to the users degree of initiation, the allotted degree of use and degree of participation in designing and carrying out [3].

Table 2. The Kolb-Frohman normative model of change in system execution.

Research	The user and the designer estimate each other's needs in order to decide if there is a fit. A starting point for the project is selected, appropriate for the organization.
Beginning	The user and the designer establish the initial goals and objectives. Commitment to the project is also defined. The user and the designer build a trust relationship and a "contract" for project leading.
Diagnosis	The user and the designer gather data to refine and polish problem definition and the purposes for a solution. The user and the designer estimate the available resources (including commitment) to ascertain if an effort continuation is feasible.

Planning	The user and the designer define the operational specific objectives and examine alternative ways to accomplish these objectives. Impact of the proposed solutions on all organization parts is also examined. The user and the designer set out an action plan that takes into account the solutions impact over the organization.
Acting	The user and the designer put into practice the best alternative. The required training to improve efficiency in using the system is performed in all interested parts of the organization.
Assessment	The user and the designer estimate the level of achieving the goals and objectives (specified along the diagnosis and planning phases). The user and the designer decide if work on the system is still needed (to evolve) or to cease active work (to terminate).
Finalizing	The user and the designer make sure that mastering and efficient control on the new system are both in the hands of the ones required to use and maintain it. The user and the designer make sure that the required new behavioral models became a stable part of the user's routine.

Each model scenario is descriptively named in order to suggest their fundamental characteristics. The English denominations proposed by the author will be used.

Figure 2 shows Alter's six models-templates for implementation [5].

"*Join Hands and Circle Round*". According to empiric studies regarding DSS implementation, this scenario is the ideal one and most often used. Supposing all the other factors remain unchanged, the high levels of users' initiation and involvement in DSS carrying out can be associated with a high probability of success. In this scenario is assumed that no solution may be determined in advance and the user is prepared to get involved in problem defining and solving.

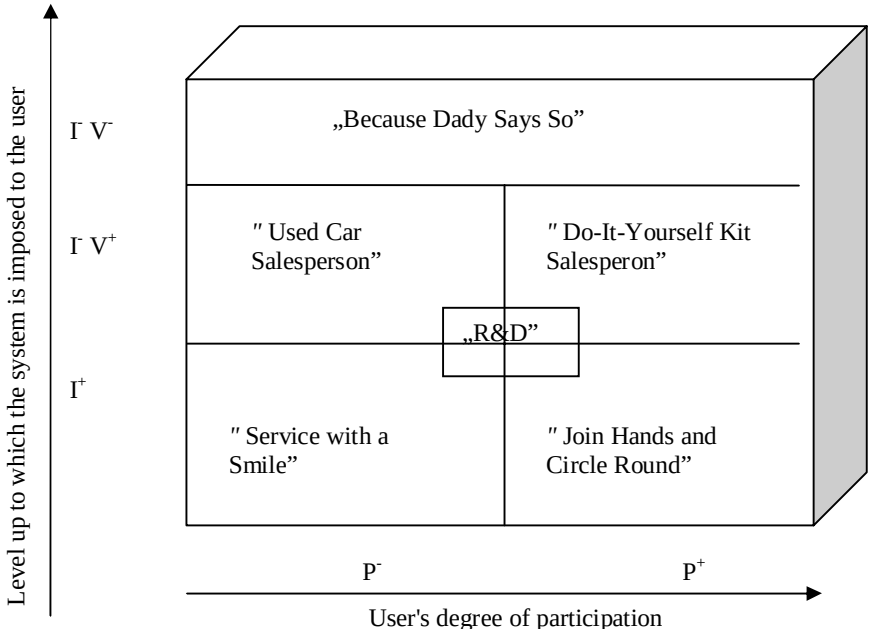
"*Service with a Smile*". In this scenario the user is oriented mostly towards acquiring a product than a service. The main purpose of this scenario is to complete the DSS with specifications framed within previously set out time and budget constraints. Just as in the previous scenario, here also the degree of user's initiation is a high one. Unlike the previous scenario, the degree of user participation in carrying it out is relatively low.

"*Do-It-Yourself Kit Salesperson*". As shown in Figure 2, user's initiation degree in this scenario is low, but the degree of a voluntary adoption is relatively high. This scenario represents an effort to change a low initiation, a situation with a low participation, into a more favorable one. In this case the user has to be convinced that DSS is needed for the company to be successful and he has to be encouraged to take part in realizing that.

"*Used Car Salesperson*". This scenario is characterized by the fact that a software consultant or provider wishes to sell the need of a DSS to the user. This scenario may bring benefits to the organization especially in the context where many system innovations and improvements came from outside the system (through outer consultants). The same scenario has a relatively high implementation risk due to the outer initiation of the system.

"*Because Dady Says So*". The fifth implementation situation is also considered a common one, where the higher management in the company empowers DSS execution and use. This scenario is deemed to be the least efficient method of bringing technologies into helping the decision support in an organization. Without proper initiation and support from the user, DSS will never become satisfactory.

"R&D". The sixth and last of the scenarios, identified by Alter can be found right in the middle of the others and it suggests that the results of a previously initiated research and the effort of realizing it may lead to a normal implementation through any of the other five scenarios.



Legend:
$I^- I^+$ - Users' degree of initiation
$V^- V^+$ - Level up to which adopting is voluntary
$P^- P^+$ - Level of participation to system's development

Fig. 2. The six templates for implementation of DSS.

5. RISKS OF DSS IMPLEMENTATION

The implementation process is exposed to risks that can be minimized if the determining risk factors are known. Thus the need to analyze the implementation risks emerges, starting from the early stages of DSS design and execution.

According to Alter, there are eight risk factors, considered significant for a successful DSS implementation. In Table 3 the risk factors for DSS implementation are shown [5].

The level of the risk factors of DSS implementation has to be determined by employing risk assessment techniques, as the risk analysis questionnaires.

Table 3. Risk factors for DSS implementation.

Risk factor	*Issue*	*Scenario*	*Result*
Users not interested or inexistent	Lack of commitments in using the system	The system is not initiated by the potential users and it is realized without their participation	Disuse; Uneven using; Lack of impact
Multiple users or implementers	Communication problems: inability to raise interest	The system requires a voluntary utilization by several individuals or a coordination through several persons	Uneven using
Lack of users, implementers or maintenance entity	There is no one available to use or alter the system	The worst case condition: The system is abandoned after installation or the system initiator leaves before the system to be installed	Low using or even system disappearance

Inability to specify the system purpose or model utilization	Over-optimism of the designer and his followers	The supposition that the ones not using the computer would find out how to use the system	Disuse
Inability to foresee and lower the impact	Lack of work motivation or changing the work model without receiving benefits	No benefit from the system for the personnel in the role "feeder"; forced changes in the organization procedures	The "why bother" syndrome; fear and/or irritation
Loss or lack of support	Requirements for founding; obstructions from non-cooperative people	Lack of budget to roll the system; lack of managerial action to efficiently use the system	Disusing or system death
Lack of experience with similar systems	Unfamiliarity that leads to mistakes	Building up an innovative system pointing towards substantial changes, rather than automatization	Technical issues; weak solution and problem integration; System misuse or disuse
Technical problems and costs efficiency	Maintenance cost and system enhancement cost	A propaganda situation: no adequate way to assess the system's value either before or after potential improvements	System's failure to satisfy the needs; it either passed above or is given up

6. DSS INTEGRATION

6.1. The integration process characteristics

The importance of the DSS integration within the architecture and infrastructure of the organization's information system derives from the need of interconnecting the system with other technologies and applications in order to extract and analyze data and information.

DSS integration represents the process through which the system is interconnected and it unitarily communicates at normal parameters with the other technologies and applications within the architecture of the information system.

According to Marakas there are two DSS integration categories, which are: the functional integration and the physical integration [3].

Within the *functional integration*, the decision support functions are integrated and united with the one existing in the system's infrastructure. This union provided a common access to the menu, internal and external transfer of data and object, as well as a common interface. Thus one or more users may access the decision support mechanisms in the organization, available through integration.

The physical integration involves the hardware, software and data communication architectural organization for the new DSS in concordance with the one of the hardware infrastructure in the organization.

The physical and functional integration activities are often in the technical field, and unique to each organizational environment.

6.2. Integration models

The process of information systems integration had been study object in various works and practical approaches that tried to shape some models of DSS integration.

According to Turban and Aronson, the functional integration may be considered at two levels, this way: (1) among different DSSs and (2) within the same DSS [11]. Figure 3 shows the model of the two integration levels.

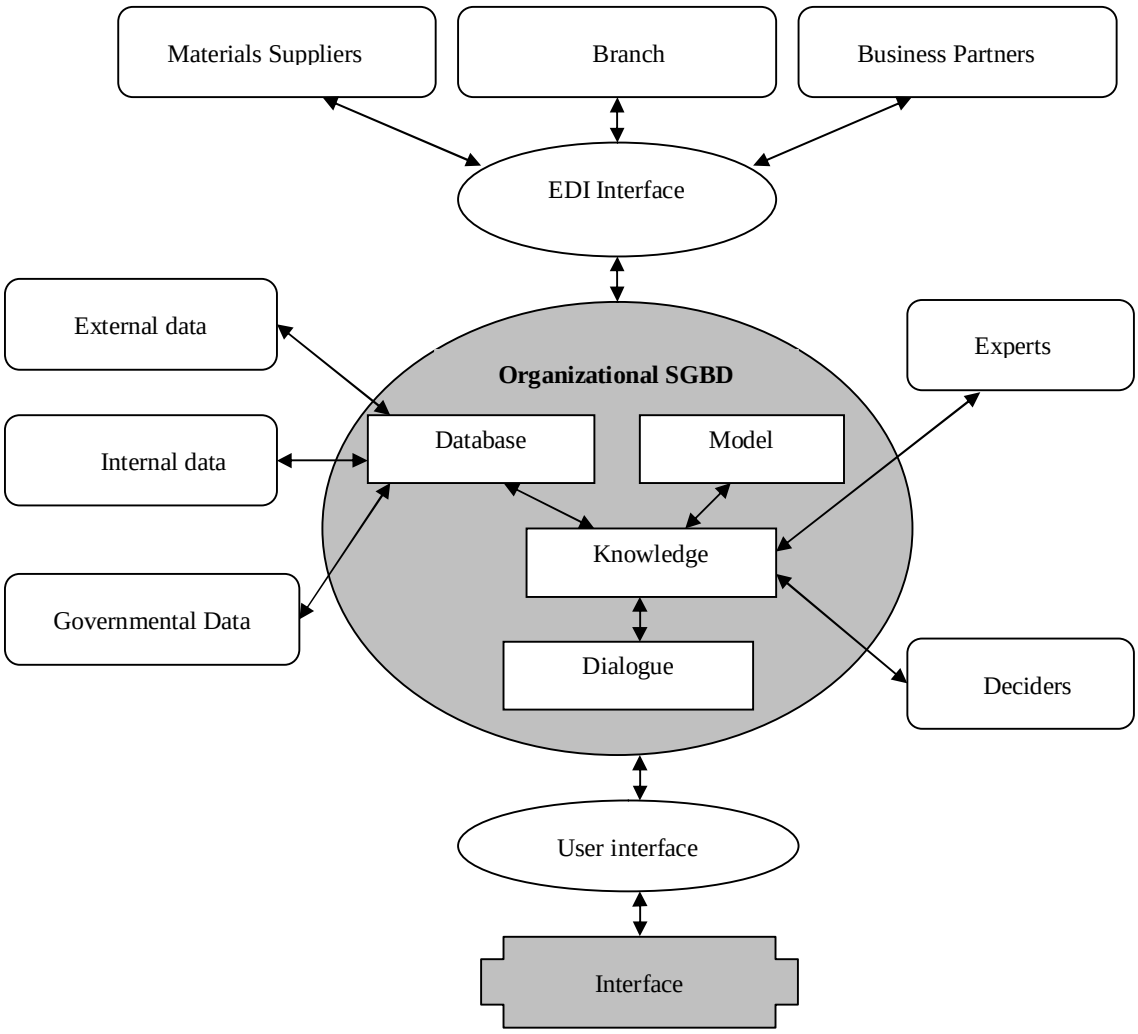


Fig. 3. The DSS integration model at various levels.

Most of the DSS integration models focus on the decision support systems integration (DSS), expert systems (ES) and integration of the information system for executives (ISE) within the architecture of the organization system.

According to Marakas, the most important aspect in integration of technologies for decision support is their ability to globally interconnect and the unitary access of all the communication channels and decision mechanisms in the organization. In this context he proposes a generalized and global mode for DSS integration, shown in Figure 4 [3].

Concerning the functional integration, *the new technologies based on enterprise portals* may have a major importance in the DSS integration process. In this matter a functional integration model was proposed, at the level of the DSS interface and access, using a particular form of the enterprise portal which we named *the decision making portal*, which can also facilitate the cooperative processes within the decisional environment of the organization. Figure 5 shows the process of functional integration through the decision making portal.

The decision making portal is an integrated interface of the decision support systems and collaborative technologies, which creates a unitary environment for taking part into the decision making process and is a permanent support for the decision making factors.

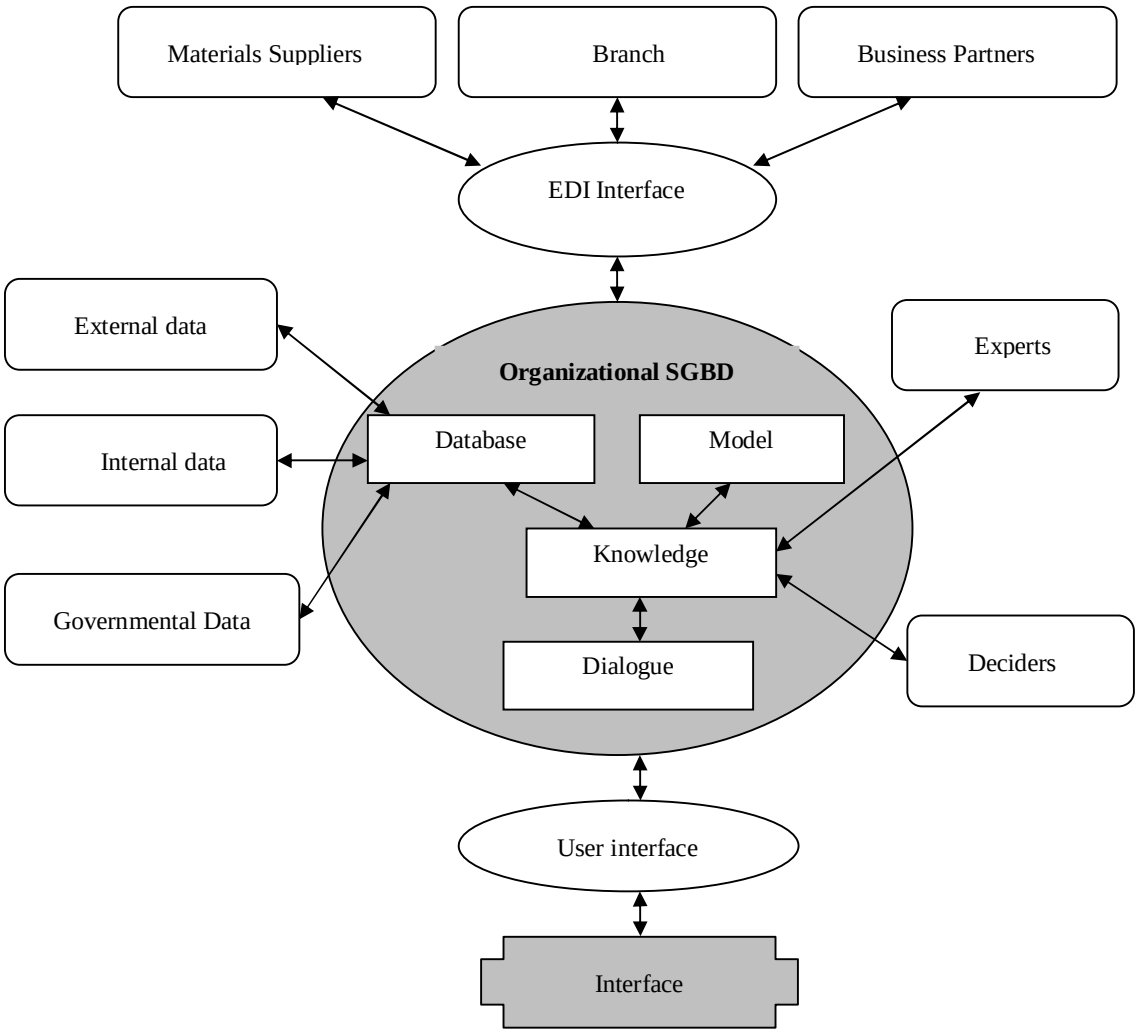


Fig. 4. Generalized concept for DSS global integration.

7. DIFFICULTIES IN THE IMPLEMENTATION AND INTEGRATION PROCESS

Turban and Aronson had synthesized a series of problems that might occur at DSS integration [11]. These are the following:

Need for integration. Integration may be wanted or not. A full feasibility study is essential in order to determine this aspiration.

The cost-benefits analysis. The integrated systems imply a series of costs for the offered benefits. Transforming an information system into a more intelligent one is a new idea, but this idea has to be supported also from a financial point of view, and somebody has to assume the investment risk. Thus, the integration process has to be based on a costs-benefits analysis that could justify investment's value in the integration.

The integration architecture. In order to carry out the integration there are more than one alternative. Each of these options implies the existence of benefits, costs and limitations. This is the reason why before integration a very careful analysis is required.

Problems related to people. Technologies integration for decision support reunites, between these and with other conventional systems, two different styles: judgmental (heuristic) and analytical (algorithmic). This combination certainly means change for many people. The designers and other users, used to work with conventional instruments and applications, are asked to work with new symbols and processes. How these people will be affected? Combining the two approaches and solving these problems might be complex enough, taking into consideration the organizational culture also [1].

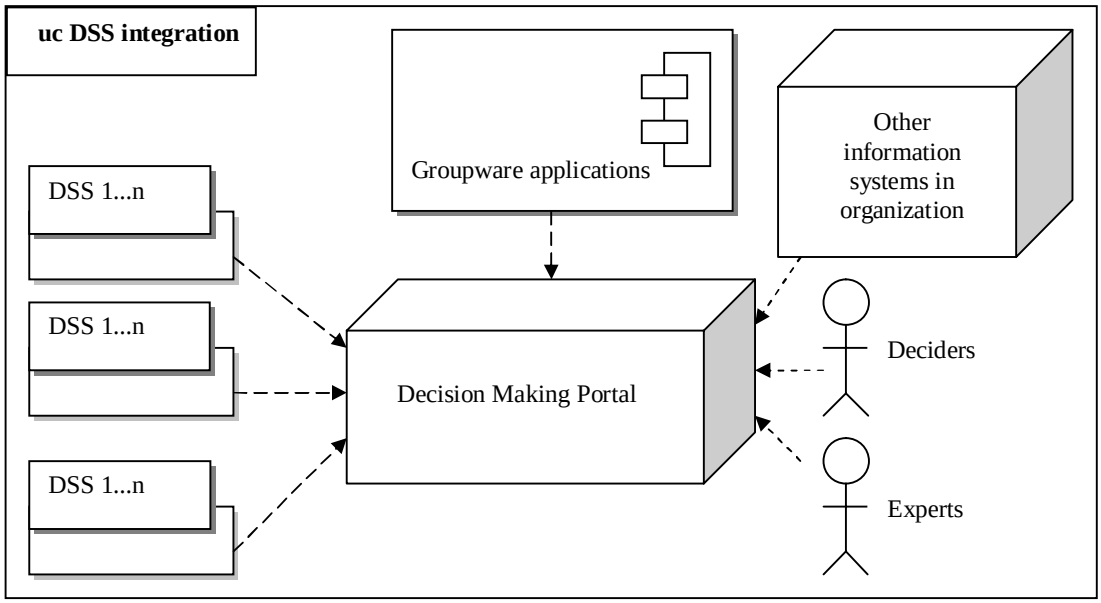


Fig. 5. The DSS functional integration through the decision making portal.

Identification of well qualified programmers. Finding competent programmers who can work with both DSS technologies and conventional information systems might be difficult tasks, especially if complex systems are involved.

Information department employees' attitude. Some professionals in the information systems did not take seriously the DSSs, the way they didn't take seriously the personal computers also, in their beginnings. They are refractory to new technologies but they have to understand that DSS is a supplement for the conventional instruments and applications and not a replacement of those.

Development process. The development process for many informatics projects has a sequential approach of the lifecycle. In contrast, most of DSSs are developed through prototyping. When the two are combined, there is a problem of not being able to complete the system of the deadline. This coordination problem has to be planned, especially when we talk about institutional system with large dimensions.

Organizational impacts. The IT department's director or the chief of the calculations office are the most affected by DSS introduction. DSS implementation and integration impact on activity and on the two positions has to be carefully analyzed.

Problems related to data structure. The artificial intelligence applications are focusing on symbolic processing, whilst the DSS project are built with numeric processing. When these systems are integrated, the data has to pass from one environment into another different one. The databases are differently structured compared to the knowledge base. Ina knowledge base, the procedural information and the declarative information are separated, while in a database everything is combined. It is easy to develop a concept system with a database and a knowledge base and to show the interconnection of the two. The problem is how the translation of data and information between the two would be carried out.

Problems related to data. Many DSS applications, especially the expert and neuronal systems may contain incomplete data, partial or inconsistent ones or heterogeneous, of various sizes and accuracy. The DSS, IES and traditional information systems cannot operate with these data entries. For example, when an ES is used in the beginning and at the end for a DSS, the incomplete data has to be organized and prepared according to the database's entry requirements. This is valid also when the DSS exits become entries for an ES.

Connectivity. The artificial intelligence applications can be programmed in LISP, PROLOG, generating SE, C, C++, special instruments for knowledge engineering, or a combination of the above. The interpretation programs can be written in C, C++ or Pascal, but not necessarily in the same language the DSSs had been written, thus resulting connectivity problems at the level of the programs libraries. Another problem is the one that many suppliers of artificial intelligence tools offer SGBD interfaces and table datasheets, whose use may be complicated enough.

8. ASSESSMENT OF THE DSS IMPLEMENTATION SUCCESS

According to Turban and Aronson, the definition of implementation includes the condition of success. Many studies carried out on the implementation process had identified a certain number of possible indicators in order for a designed and implemented information system to be perceived as a success [11].

Criteria for DSS assessment include the following:

- placing the costs for DSS implementation and carrying out within the limits provided in the project budget;
- respecting the project execution deadlines provided in the project;
- the level of satisfying the information needs of the decision making system;
- the way the information needs are satisfied for the decision making system;
- project's impact within the collection of the informatics application of the company;
- extent to which users' expectations are fulfilled. Assessment of this extremely important criterion for a successful DSS implementation is carried out by interviewing the users (all or only a representative sample of them);
- degree in which system is fulfilling its original objectives;
- additional income of the entity acquired by a DSS implementation.

Assessment of these general criteria and possibly of others leads to answering the main question posed in this lifecycle of a system: was the DSS implementation a success or a failure [14].

Klein and Methlie had set out a work frame (Table 4) that contains four categories of indicators (measurements) for assessment of DSS implementation success [15].

Table 4. Work frame for DSS implementation success evaluation.

System's performance	Efficiency and response time Data entries Exits formats Hardware Usage Man-machine interface
Task performance	Time for adopting decisions, alternatives, analyses, quality and participants Users' perceptions on trust, satisfaction, utility and understanding
Business opportunities	Costs for execution, operation and maintenance Benefits associated to income increasing and costs decreasing Organization's value through improved services, competitiveness advantage and preparations
Evolutionary aspects	Degree of flexibility, ability of change General operation of the execution instruments

System's performance. The first of the Klein and Methlie frame categories focuses on the quality of the information system [15]. In this category a series of problems are identified and measured, as: response time,

availability, time of use, stability and quality support for the system. These measures may be obtained with the help of a wide variety of methods, including direct observation, event recording, attitude noting or perception building. The general quality of the DSS performance is most of the times in a tight correlation with the system's acceptance by the user.

Task performance. This estimative category focuses less on performance and has in view issues related to DSS operation within the context for which it was designed. Ideally, from a DSS is expected to increase the value of the decision making process. Unfortunately, the uncertainty degree, associated or not to a structured decision making context, is directed towards the result's quality. Once the decision is adopted, the result is often lost from the decider's control. As consequence, we can say a high quality decision doesn't necessarily occur from a very good result. Moreover, a very good result may occur by chance, even in the conditions of a poor decision.

Following, the task performance is measured rather by focusing on what can be controlled (decision's quality) than on the things that cannot be controlled (result's quality). The decision's quality may be estimated by the time taken by the decision making process, the number of assessed alternatives and searched information. Together with these, qualitative measures may be included, focusing on trust, satisfaction and understanding.

Bussiness opportunities. The third category measures the DSS effect on certain organizational factors. Executing and implementing a DSS requires normally a significant involvement of organizational resources, standing for both money and time. The effect of this involvement may be used to determine the level of success obtained in this area. This category is firstly of a quantitative nature and includes measures that focus on income increasing, costs reduction, raising preparation efficiency, increasing the competitive advantages and changes in productivity.

*Evolutionary aspects***.** This category estimates the flexibility of DSS in adapting to the changes of the organization environment where it was implemented. The requirements of the decision making factors and the unstructured or semi-structured problems' dynamics they are confronted to affects the DSS structure and operation. The DSS ability to adapt to these changes is often a function of the instrument employed to execute the system, respectively the user, to make the appropriate needed changes in data and models. Despite the qualitative nature of this category, flexibility and adaptability perceptions influence the whole performance and quality of a DSS.

The DSS implementation and integration must be considered as a whole and approached as early as in the stages of designing and carrying out the system. In the DSS carrying out process it is recommended to insert analysis procedures of successful implementation and integration possibilities, based on models, factors and criteria shown in this paperwork.

9. CASE STUDY AT THE ENERGETIC COMPLEX OLTENIA SA COMPANY

9.1. Organizational structure

The commercial company The Energetic Complex Oltenia - S.A., company managed in a dual system, through Directorate and a Surveillance Council, was established in 2012 by fusion between four commercial companies (The National Lignite Company Oltenia - S.A., The Commercial Company Energetic Complex Turceni - S.A., The Commercial Company Energetic Complex Craiova - S.A., The Commercial Company Energetic Complex Rovinari - S.A.) and it has as a main object of activity producing and supplying of thermal and electric energy, as well as exploitation of lignite mines and quarries.

The commercial company "The Energetic Complex Oltenia - S.A., company managed in a dual system has the following organizational structure: General Direction; Energy Division; Financial Division; Mine division branch; Development strategies division; Human resources divisions; Wages, Safety Structure.

The Enegetic Division has under its command three branches: Power plant branch Craiova (Işalniţa Plant, Craiova 2 Plant), Power Plant Rovinari, Power Plant Turceni.

The Mine branch division has under its command eight branches: Mine Exploitation Jilţ, Mine Exploitation Roşia-Peşteana, Mine Exploitation Berbeşti, Mine Exploitation Quarry Motru, Mine Exploitation Rovinari, Plant

lines and Railways Exploitation (E.L. C.F.U.) Motru, Supplying Base and Active Valorization (B.A.V.A.) Rovinari, Workforce Recovery, Perfecting and Formation Center, (C.R.P.F.M.) Săcelu.

9.2. Production capacities

The commercial company Energetic Complex Oltenia - S.A. has the following production capacities:

- 12 energetic blocks with an installed power of 3570 MW, out of which:
  - SE Rovinari - 4 energetic blocks of 330 MW in condensation on lignite;
  - SE Turceni - 4 energetic blocks of 330 MW in condensation on lignite;
  - SE Craiova - 2 energetic blocks of 315 MW in condensation on lignite at Işalniţa Plan.
- 2 energetic blocks of 150 MW/ 160 Gcal on lignite in co-generation at Craiova II Plant.
- A number of 79 high capacity mining machinery, distributed in 15 quarried, that can ensure a production capacity of over 30 million tons lignite per year.

The commercial company Energetic Complex Oltenia - S.A. has personnel of approx. 18800 employees, out of which in the energetic activity are employed approx. 5800 persons and in the mining activity approx. 13000 employees.

The market quotation on 31st of May 2012 was: Hidroelectrica – 25%; Nuclearelectrica – 19%; Deva - 4%; Energetic Complex Oltenia – 29 %; ELCEN Bucureşti – 8%; Altele 13 %; TOMIS TEAM – 2%.

9.3. The financial situation

According to the balance of 2011, the four companies recorded the following figures:

- net profit**:** S.N.L.O. – 32 million lei, C.E. Turceni – 55.5 million lei, C.E. Craiova – 795 thousand lei, C.E. Rovinari – 33.3 million lei;
- turnover: S.N.L.O. – 1083 million lei, C.E. Turceni – 1529 million lei, C.E. Craiova – 1228 thousand lei, C.E. Rovinari – 1018 million lei.

The result of the activities developed within the Energetic Complex Oltenia (C.E.O.) consists in three products: coal (lignite), electric energy and thermal energy.

The coal beneficiaries are the following: Power Plant Brances of C.E.O. (Craiova, Rovinari, Turceni), CET Govora, RAAN Drobeta Turnu-Severin, CET Timişoara, CET Arad, CET Oradea, CET Braşov, Thermal Agent Plant and Water Supply (UATAA) Motru.

The main beneficiaries of the electric energy are:
- the market of electric energy providers consisting in 15 commercial companies;
- the retail sale market, consisting in 5 industrial commercial companies.

The main beneficiaries of the thermal energy are: 13 industrial commercial companies, 2 school units, 5 public institutions and one superior education institution.

9.4. The decision support systems implementation and integration strategy

Based on the carried out analysis, among the strategy categories for implementing the DSS at the company level, in order to improve the implementation process the strategy *"Satisfying the users' needs and system institutionalization"* was chosen.

Analyzing the scenarios for DSS implementation, that differ according to the degree of initiation of the users, the empowered degree of utilization and the degree of participation in design and execution at company level, the scenario *"R&D"* was adopted, that suggests the results of an internal research and the execution effort may lead to a normal implementation.

The DSS implementation was decided through using the technique of risk assessment based on the risk analysis questionnaires.

The importance of the DSS integration aspect within the architecture and infrastructure of the information system of the company derives from the need of interconnecting it with other technologies and applications existing at the company's level, for data and information extraction and analysis.

DSS integration is the process through which the system is interconnected and unitarily communicates at normal parameters with other technologies and applications within the existing information system's architecture, within the units of the organizational structure of the company.

After analyzing the success factors of DSS implementation, the project was assessed according to criteria like the profit-cost ratio, opportunity of project implementation and users expectations regarding the benefits that might come from using the DSS.

The work frame containing four categories of indicators (measurements) for assessment of the DSS implementation success is the one carried out by Klein and Methlie and it has in view [15]:

System's performance. In this category a series of indicators were identified and measures, as: response time, availability, time of use, stability and quality support for the system. The general quality of the DSS performance is most of the times in a tight correlation with the system's acceptance by the user.

Task performance. This estimative category has in view issues related to DSS operation within the context for which it was designed. From a DSS is to be expected to increase the value of the decision making process.

Business opportunities. Executing and implementing a DSS had required a significant involvement of organizational resources, standing for both money and time. This category is firstly of a quantitative nature and includes measures that focus on income increasing, costs reduction, raising preparation efficiency, increasing the competitive advantages and changes in productivity.

Evolutionary aspects. This category estimates the flexibility of DSS in adapting to the changes of the organization environment where it was implemented. The DSS ability to adapt to these changes is often a function of the instrument employed to execute the system, respectively the user, to make the appropriate needed changes in data and models.

The DSS implementation and integration process was considered as a whole and approached as early as in the stages of designing and carrying out the system. In the DSS carrying out process were included procedures of analysis of a successful implementation and integration possibilities, based on models, factors and criteria shown in this paperwork.

10. CONCLUSIONS

Both the company itself and its employees adopt the decision support systems in order to improve some aspects of their own activities.

The main conclusions of using DSSs into the Energetic Complex Oltenia SA refer to the following:

1. Improving efficiency in the managerial activity
Many DSSs don't fulfill any functions that a person couldn't do. For example, long before these automated systems occurred, men carried out budgets, but occurrence of these systems improved quality and speed of this activity. Because of this, in present few are the ones who give up these systems in favor of manual techniques.

2. Improving the problem solving process
If the previous category addressed strictly the efficiency of performing and solving calculi, this category regards DSS advantages in overall problems solving, including here the tasks mentioned in the above clause. The DSS offer possibilities for a person or a group to find a solution for solving these problems, faster and more efficient than not using DSS. Certainly there is a connection between these two advantages, because improving efficiency in managerial activity could lead to solving the overall problems too.

DSS may improve decision consistency by information about similar decision already existing in the system, taken in the past or about the same type of decision that have to be taken in the future. At the same time, consistency is ensured also by ensuring the same hypotheses and formulae for all the decision factors.

3. Facilitating communication
Alter discovered several ways for these systems to facilitate interpersonal communication. Moreover, due to the technological progress that took place, new possibilities to fructify this advantage appeared. One of the ways these systems can improve communication is using them as convincing means. The systems can show when a decision had to be adopted in the future (offensive use) or when a certain decision was justifiably adopted in the past (defensive use). Another way the DSSs facilitate communications regards setting up a common decision making base by standardization of processes, mechanisms and vocabulary used by the decision factors. For example, two persons could have different opinions about the implications that a lower company turnover could have, their opinions being based only on the previous year's data.

In the same category of advantage there is the term of groupware, addressing a software system designed to help a managerial group in decision making process. In order to be able to fulfill this role, the groupware has first of all to show the interpersonal communication component. Certain forms of groupware facilitate communication by offering means of communication much more efficient than the ones previously available. A few examples are: electronic mail, various forms of electronic conferences. Other forms offer support fulfilling an administrative role in the decision making process, in other words these systems can set out meetings between the persons in the group according to each person's time. As a rule, these systems are rather classified ad bureaucratic tools than DSSs, this proving once more that the borders between systems are few or well defined.

4. Promoting learning and education
Knowledge improvement was very seldom a goal in itself for the DSS systems, today though most of the systems are designed having integrated this component. Studying, in a DSS system, it's a process that takes place when the system is used several times, since the user can see the types of decision which are favorable in certain conditions, and the acquired experience allows him to get a visualization of the effect of these decisions. This is the reason why the systems based on this component have to pass beyond a simple interrogation of a database and showing the results to the user, these have to closely follow the complex stages of a human decision making process. Using the DSS systems may also contribute to the user's education in regard of computer usage and the programs in relation to the system.

5. Improving control within the company
This factor addresses DSS use as a means of imposing company's norms and standards on the individual users' decisions. Some systems may draw up reports on users' decisions, reports that can be controlled by users' managers. This information can be later used to assess user productivity by following the volume and quality of the adopted decisions. This component, though already existing in the system, should be cautiously used because it might have an influence on the decision making process, encouraging the users to adopt only "safe" decisions, which not always would be beneficial for the organization. Another negative part of this component would be the one of trespassing users' right of intimacy, which could lead to lower morale and productivity.

6. Including procedures for analyzing the possibilities of successful implementation and integration
Within the DSS execution process, incorporating procedures for analyzing the possibilities of successful implementation and integration is recommended, based on models, factors and criteria presented in the paperwork.

DSS carrying out and implementing requires normally a significant involvement of organizational resources as money and time. The effect of this involvement may be used to determine the level of success in this area. This category is, firstly, of a quantitative nature and it includes measures that focus on increasing the income, decreasing the costs, increasing the preparation efficiency, increasing the competitive advantages and changes in productivity.

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