Computer system for farms (SITEFA) - an opportunity for performant agricultural management

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COMPUTER SYSTEM FOR FARMS (SITEFA) - AN OPPORTUNITY FOR PERFORMANT AGRICULTURAL MANAGEMENT

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Abstract: Any modern agricultural unit, regardless of profile, size, ownership and socio-economic space in which they operate, requires a management style based on flexibility, dynamism and foresight, which is inconceivable without a complex, operative and quality information, to underpin decision making. Therefore, any farmer needs objective, relevant, reliable, timely, useful, concerning: market demand, new products and technologies, the position of competitors, suppliers and customers, their performance, etc., so that their analysis to directly influence and as the competitiveness of the farm in a particular market or market segment. Based on the theme of the "Determination of economic indicators of crop production technologies and animal applied in order to increase environmental performance (costs, productivity, profitability, gross margin)" from the Sector Plan ADER 2020 was developed computer system SITEFA - a product developed and designed program-technical-economic analysis of the performances of farm economic and efficient use of production factors in classical operating conditions.

Keywords: agriculture, computer system, farm, management, analysis

INTRODUCTION

SITEFA is a software developed and produced for technical and economic analysis of the performances of farm economic and efficient use of production factors in classic operating conditions.

The main structural elements of the informatic system SITEFA are:

- technical basis or hardware system, which consists of all technical means for collecting, transmitting, storing and processing data, the central site computer returns electronically.
- Software system, which includes all programs built for operation of the product, according to the functions and objectives that have been preset (profitability analysis and efficient use of factors of production).
- scientific and methodological basis, which consists of mathematical models of economic processes and phenomena, methodologies, methods and techniques for achieving information systems.
- information base, which include data undergoing processing, information flows, systems and nomenclatures codes.

MATERIAL AND METHODS

From a technical standpoint, SITEFA is an application built on a platform Microsoft Excel using Visual Basic tool because it allows to describe control structures, procedures and user functions. Visual Basic is part of Microsoft's Visual Studio package and, as well as other languages 'visual' Microsoft is focused on component interface of the program is easily possible to create Windows-standard interfaces (windows, buttons, lists etc.), without having to be written source code for this.

Visual Basich as a library of visual components (lists, calendars, menus etc.) whose components (graphics and functional) are already implemented, with the possible introduction and use of its components or realized within other applications. On the basis of information system design SITEFA stayed both elementary functions and special functions (called macros, involving macro-commands and macro-functions), the latter being in the utility of the application Microsoft Excel Visual Basic.

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RESULTS AND DISCUSSIONS

From a functional perspective, the computer system SITEFA has the following functions:

- Generating technology/technology and estimate of revenue and expenditure for each of the types of crops recognized by the system based on the input data.
- Determination economic indicators of crop production technologies.
- Maintenance of all subsystems (lists and tables) used to obtain the results generated by the computer system.
- Function to create/update: the system is equipped with a special feature for creating and updating its constants (maintenance); This function can perform the following:
  - updating /changing information contained in system nomenclatures and tables;
  - adding new records (mechanical works, manual work, materials and equipment, crop types, etc.);
  - deletion of certain information from databases;
  - looking/checking the desired information;
  - nomenclatures listing or other useful information from the system.
- Search functions, location, calculating, extracting information from the database and preparing for listing will be the most important component of the system that will be incorporated algorithms calculation procedure.

Description of information flow

In terms of construction, a computer system includes input into the system (inputs), constant system (information taken from lists and tables) and system output data (outputs or reports).

a. The input data is any information entered by the user of the system, according to the objective pursued, for example:
   - type of culture,
   - production area (plains, hills, mountains) /production system (irrigated, non-irrigated)
   - used agricultural surface
   - rates mechanical works,
   - manual work rates,
   - materials and materials prices,
   - selling price main production,
   - selling price secondary production,
   - the subsidy per hectare,
   - the proportion of different types of expenses (supplies, labor, with insurance, and general management, with the interest rate)
   - values for other expenses (reduction in value on buildings and utilities, taxes and fees)
   - opening balance etc.

b. The constants are classifications system, internal tables and tables linking the program; system uses the following tables:
   - table culture
   - table with manual work
   - table with mechanical works
   - making materials and materials
   - making the necessary annual (monthly rations of forage types)
   - action table for each crop plant
   - table with pesticides (fungicides, herbicides).

These constants can be updated through maintenance (maintenance) nomenclatures and tables used.

c. The output are there ports that are generated after charging system input and constants defined, based on algorithms specific to each module design; examples:
Fig. 1. Spreadsheet for price update/input

After execution of the program, the user can choose one of the following crop, which are specified potential, production and average secondary production. After choosing culture will be generated following spreadsheet:

- rates;
- technology;
- the income and expenses;
- standard gross margin (SGM);
- technical and economic indicators;
- breakeven (PR).
The spreadsheet "Prices" – in this spreadsheet user is given the possibility to insert /update the prices of raw materials and materials used for the crop; also lists the quantities which are recommended to be used for each of the selected materials(Figure 1):
- Herbicides;
- Fungicides;
- Insecticides,
- Fertilizers,
- Other materials (string, seed treatments, etc.); seed;
- Water for irrigation;
- Rates mechanical works (unfinished production and production in progress).

The spreadsheet "frame technology" (Figure 2) is generated culture technology based on prices and tariffs introduced/updated above.

The spreadsheet "The income and expenses" (Figure 3) is shown culture budget. It is a synthesis of all revenue and expenses that crop. The budget is calculated in three variants: no lease, the lease and lease expenses from income.
Fig. 3. Spreadsheet „Budget for revenue and expenditure”

The spreadsheet "Standard gross margin" (Figure 4) enables calculation of standard gross margin (expressed in RON and EUR).

For the calculation of standard gross margin were considered direct costs or expenses standardized variables specific crop production such as:
- Seed and planting stock (purchased or produced on the farm)
- Chemical fertilizers,
- The purchase or manure from their own farms,
- Crop protection products,
- Crop insurance
- Water for irrigation,
- Heating,
- Specific marketing costs (cleaning, packaging)
- Other specific costs proportionate.

The specific costs are not included in labor costs, mechanization, buildings with fuels and lubricants, car repairs, depreciation and expenses made by third units. These expenses are highlighted specific cultures of their size unit activity in each culture.
In the spreadsheet "technical-economic indicators" (Figure 5) are calculated a number of financial indicators:
- Unit cost of production,
- Price recovery,
- Labor costs 1000 lei production value,
- Expenditure on materials lei 1000 production value,
- Profit,
- Rate of return etc.
Profitability analysis is important not only for assessing performance in economic unity, but also for choosing the most effective measures on the financing of economic growth, as achieved breakeven junction between industrial and financial strategy.

In the spreadsheet "Breakeven" (Figure 6) are some possible scenarios: increased production by 20%, decreased production value by 20% and 10% decrease in fixed costs.

Analysis of profitability forecasting gross product based on break-even scientifically possible to establish physical volume output is obtained and delivered cost-effective and also indicates the physical volume of output produced and sold (including the structure and its average selling price the recipients subunits, period and quality) in order to achieve a competitive level of gross profitability of domestic and foreign product coming period.
CONCLUSIONS

Analysis of manufacturing activity is based on specific economic and physical indicators which along with accounting packages allow the farmer more analytical records of expenditure and revenue and provide management information needed to plan the best allocation of resources (e.g. staffing, operational mobility and the amount of resources required) to choose one of several possible or to conduct a study on the impact of the use of certain resources or to compare the results with those planned.

Among the indisputable advantages of this analysis mention:
- allows for production levels that no longer loss or programmed to produce a level of profit;
- highlights correlations between production development revenue and costs, grouped into variable costs and fixed costs;
- allows for utilization of production capacities in terms of obtaining a particular profit program and its growth paths;
- allow the development of hypotheses and simulations on the profits of the company;
- allows optimal sizing decisions on production capacity and make investments for the development and modernization of each company.

BIBLIOGRAPHY

8. Chen P.- “The entity-relationship model, ALM transaction of database systems”, 1, 1, mars 1976