



Play4Guidance

Business Game

Player's Guide

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Index

The game, in summary	4
General characteristics of the market	4
Business activities	6
Introduction to the use of the software system	8
Data dictionary	15
Target Variable	15
Total value of the company.....	15
01. Supply Management	15
<i>Decision</i>	15
Order of packaging.....	16
<i>Results</i>	16
Raw material purchased from local supplier.....	16
Stock inventory of packaging.....	17
<i>Market data</i>	17
Wholesale purchase price of packaging	18
Purchase price retail packaging	18
<i>Operating parameters</i>	18
Capacity of a container.....	18
02. Production management	18
<i>Decisions</i>	18
Quantity of raw material to be processed	18
Purchase of new machines	18
Assumptions.....	19
Dismissal	19
Expenditure on formation	19
Technology expenditures to improve energy	19
Technology expenditures to improve the effectiveness	20
<i>Results</i>	20
Finished products of high quality made	20
Stock inventory of finished products of high quality	20
Production capacity	20
Processing cost per unit	20
Weighted average cost per unit of finished products	21
Machines company	21
Workers company	21
<i>Market data</i>	21
Salary	21
Rent sheds	21
Cost of electricity	21
<i>Operating parameters</i>	22
Manual capacity	22
Capacity with machines.....	22
Purchase cost of a machine	22
Number of workers for machine	22
Minimum number of products per unit of raw material.....	22
Maximum number of products per unit of raw material.....	22
Additional charge for post-pay payment of machines.....	22
Annual expenditure on training.....	23
Expenditures on technology necessary for efficiency.....	23
Expenditures on technology necessary for effective	23
Interest rate active.....	23
Interest rate liabilities.....	23
03. Management of marketing and sales	23
<i>Decisions</i>	23
Supply of finished products to the store	23
Sale price of a finished product to stores	23
Offer of high quality finished products to hypermarkets.....	24
Offer of finished products of medium quality to hypermarkets.....	24
Sale price of a finished product to hypermarkets.....	24
Advertising expenditures	24
Purchase of market data	25
<i>Results</i>	25

Finished products sold in stores	25
Revenue of the month from stores	25
Finished products sold in hypermarkets	25
Revenue of the month hypermarkets	25
<i>Market data</i>	25
Maximum sale price accepted in stores	25
Maximum sale price accepted in hypermarkets	26
<i>Operating parameters</i>	26
Cost of market research base	26
04. Overall results of management	26
<i>Results</i>	26
Financial availability	26
Interests on the current account	26
Labor cost	26
Accounts payable to suppliers	26
Fund expenditures on technology for efficiency	26
Fund expenditures on technology for effectiveness	27
Indicator of expenditures on technology for efficiency	27
Indicator of expenditures on technology for effectiveness	27
05. Market research	27
<i>Market data</i>	27
Supply of raw materials from local supplier	27
Minimum purchase price from local supplier	27
Average purchase price from local supplier	28
Maximum purchase price from local supplier	28
Minimum quantity of raw material ordered to the foreign supplier	28
Average amount of raw material ordered to the foreign supplier	28
Maximum quantity of raw material ordered to the foreign supplier	28
Average value of stocks of raw material in warehouses	28
Average number of machines	28
Average expenditure on technology for efficiency	28
Total number of workers employed	29
Average value of the inventory of finished products of high quality	29
Average value of the inventory of finished products of medium quality	29
Minimum sale price in stores	29
Average sale price in stores	29
Maximum sale price in stores	29
Capacity of the final market through stores	29
Minimum sale price in hypermarkets	29
Average sale price in hypermarkets	29
Maximum sale price in hypermarkets	30
Capacity of the final market through hypermarkets	30
Minimum expenditure on advertising	30
Average expenditure on advertising	30
Maximum expenditure in advertising	30

The game, in summary

The Business Game "Manage your own company" is a simulation game between teams, where each team has the task of *managing a strategic point of view* their own business competing with the other in a market. It simulates a market of manufacturing companies, which operate by transforming raw materials into finished products, and are in indirect competition for acquisition of scarce resources upstream, in the process of acquisition of raw materials from suppliers, and downstream, trying to sell finished products to customers.

The aim of the game is to maximize the **value of the company**, assessed in terms of operating margin, recruitment policies, and the growth rate of investment and the financial results of the company itself.

- The game is divided into rounds, each round simulating a month of activities of the companies and the market. During each round, each team, in parallel with the other, *analyzes the current situation* of the company and the market, quantitatively specified by a set of "status" variables that describe precisely the situation of the company;
- The player *makes decisions* on the operational and strategic management of the company, assigning quantitative values to a set of "input" variables; these decisions, along with those taken by other teams and a set of control parameters assigned by the manager of the game, determine the new situation of the company and of the market.

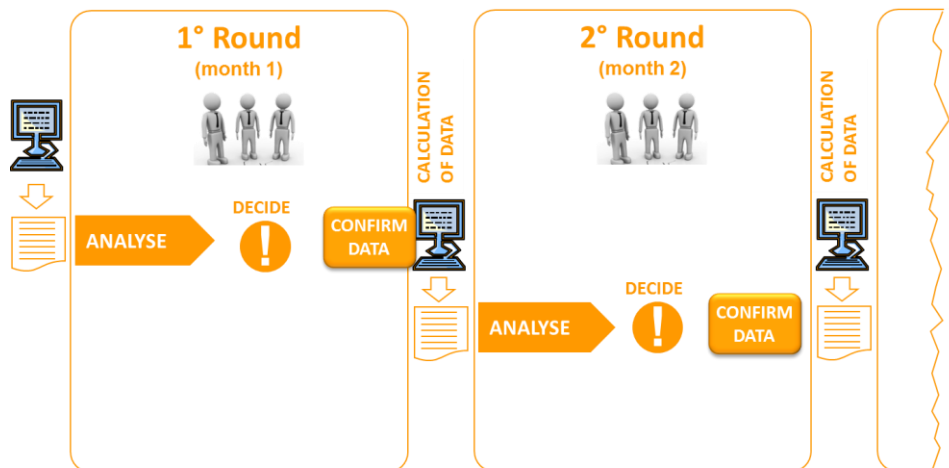


Fig. 1 The Game Process

In the first turn of the game, all companies share the same situation, which is inherited from the management of the previous year and whose decisions can therefore inspire the formation of their own strategy.

One of the variables is the **value of the company**: whose value is determined in each round of play by the decisions of the company. Any company during the game, can examine this value and compare it with that of their competitors, to try to reach the first place in the ranking.

General characteristics of the market

The market and companies are simulated from various hypotheses of simplification. The main ones are the following:

- *the companies* transform **one type of raw material** obtained from suppliers into **one type of finished product** to the end-user market;

- the *upstream market of suppliers* is composed of **only two suppliers**, to which all companies are turning: a **local supplier**, with immediate availability of raw materials and to which you can also order small quantities, but competing on the price offered, and a **supplier abroad**, which guarantees prices generally lower but accepts orders only quarterly and delivery times take longer;
- the *downstream market of customers* is achieved through **two sales channels**: **stores**, characterized by a limited ability to sell but prices can be high, and **hypermarkets / supermarkets / ...**, which are able to distribute larger quantities of finished products but at lower prices; in both channels, companies compete on the asking price, and can improve their position with appropriate investments in advertising.

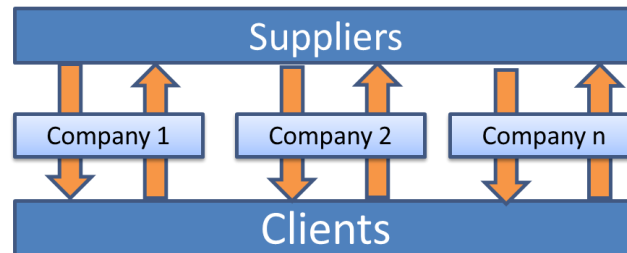


Fig 2. Suppliers and Clients

The companies have thus tools to interact directly with one / against the other. On the other hand, it becomes more difficult for other companies to be able to operate in a market in which one or more companies are able to acquire raw material or sell finished products in large quantities.

Business activities

The companies' activities are organized in three general areas:

- *the management of supply*, and therefore the relationship with the two suppliers, local and foreign;
- *the production management*, inclusive of warehouse management and production capacity (equipment and personnel) and technology development;
- *the management of marketing and sales*, through the two channels, stores and hypermarkets, according to the general scheme:

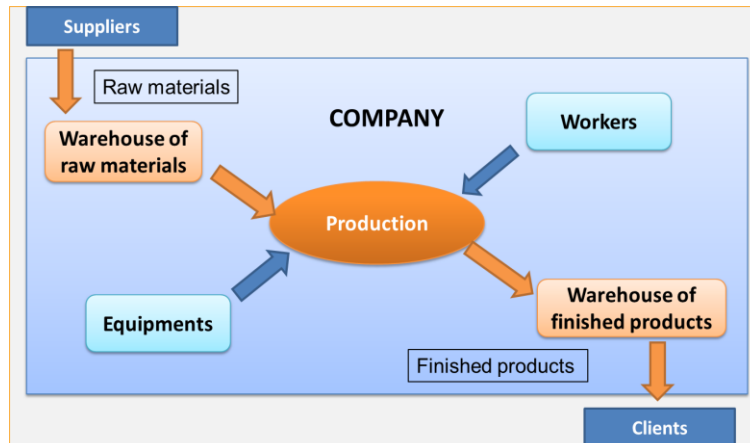


Fig 3. The Company's Activities

A schematic diagram of the activities is the following (bold arrows represent the main decisions to be taken, the dashed arrows the main results obtained):

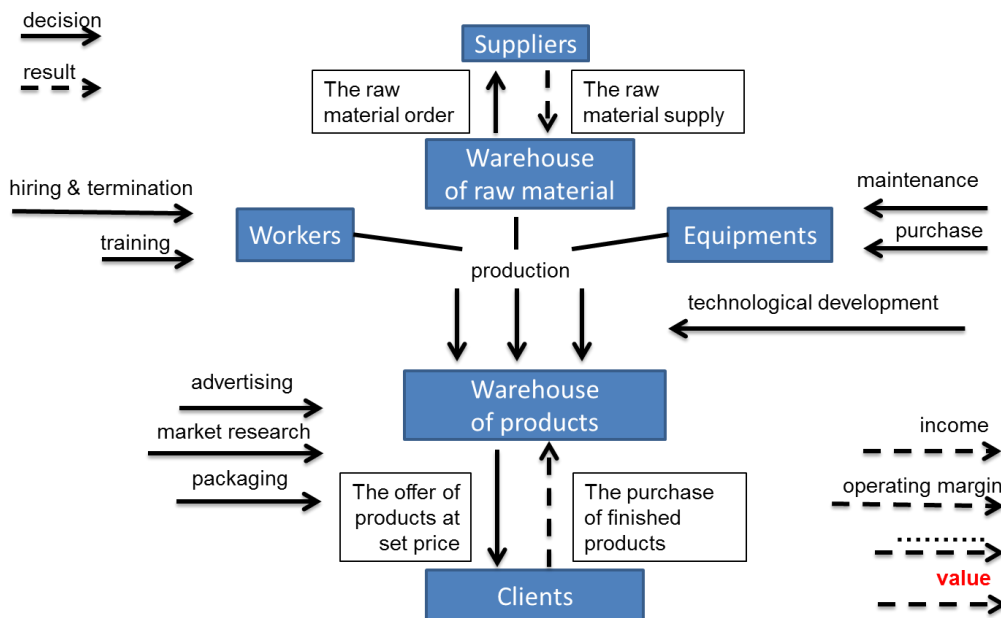


Fig.4 The Diagrams Activities

The processes that contribute to the creation of the value of each company are subjected to many conditions, described in detail in the chapter "**Data Dictionary**" of this manual. The most important are the following.

Conditions relating to the management of supply

- The company produces a **single type of finished product**, starting from a single type of raw material.
- You get the raw material by ordering it from **two suppliers**: a local supplier and a foreign supplier.
- The **local supplier** accepts orders each month and delivers the goods the following month. The quantity of raw material actually obtained depends on the sum of the orders of all companies: if you have not exhausted the availability of the supplier, you get the order; otherwise the amount obtained is reduced according to the price offered: whoever offers a higher price obtains a minor reduction.
- The **foreign supplier** accepts orders only in certain months of the year and delivers the goods with a delay of several months. The raw material is ordered with a fixed price and is transported in containers, each of which has a fixed cost of rent and a maximum capacity. Each order includes a maximum quantity of deliverable raw material.
- Regardless of its origin, the raw material received is kept in **one raw material warehouse**.
- The raw material warehouse contains a certain amount of raw material, as a result of operations inherited the previous year.
- Since the **finished products must be sold packaged**, you must also buy packaging of a single type, that is kept in a packaging warehouse. The unit cost of packaging is determined by the sole supplier, and it depends on whether they are purchased at retail or wholesale, in the specific number less than or greater than a given threshold.

Conditions relating to the management of the production

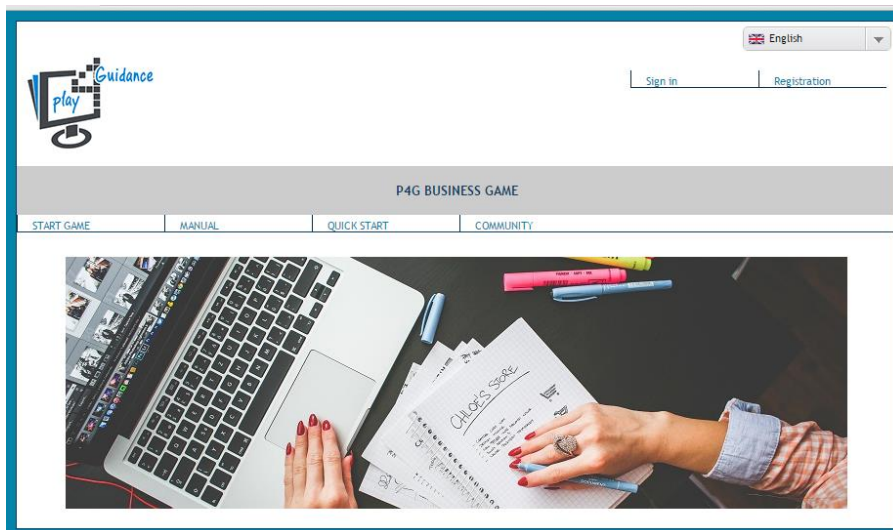
- The process of transformation of raw materials into finished products is achieved by **machines** and **workers** in warehouses, in which you pay for the rent and the use of energy. New equipment may be acquired, even with deferred payment. Workers can be hired and/or fired: their **labor productivity** can be improved by investing in their **technical training**.
- **Investments in technology** and **training** determine the **quality** of the process of transformation of the raw material. The production of finished products, broken down into **high-quality** products and products of **average quality** (maintained separately in the finished goods warehouse), depends on those investments.
- The investments allow for improvements in the efficiency and effectiveness of the process. Improving the **efficiency** increases the **number of finished products made per unit of raw material** and decreases the cost of implementation of each product. Improving the **effectiveness** increases the **fraction of high-quality products** on the total of the finished products made.
- At the **beginning of the game**, the management inherited from the previous year is such that the company is able to produce **only finished products of medium quality**. The finished products in stock are of medium quality as a result of previous management.

Conditions relating to the management of marketing and sales

- The finished products are put on sale, with their packaging, through **two channels**: **stores**, which accept **only high quality products**, and **hypermarkets**, which accept **both products of high quality and of average quality**.
- The **stores** have a capacity of less than the total sales of the hypermarkets, but **accept higher selling prices**. The sale price in **hypermarkets** is the same for products of **high quality** and **medium quality**.
- The number of finished products sold in stores and hypermarkets depends on various factors, including the **asking price** and the investments made in **advertising**.

Introduction to the use of the software system

The game takes place over the Internet and the control system of the game is available using any web browser. The Internet connection must be active for the duration of the game.



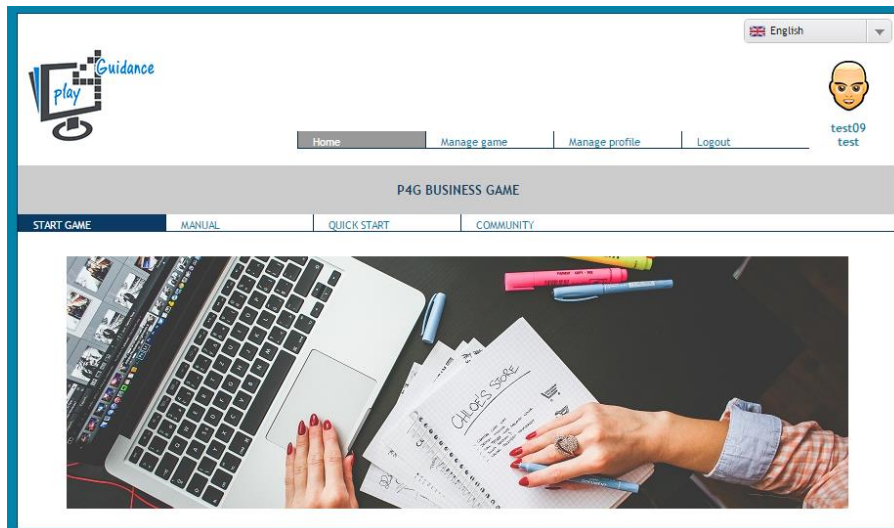
- <http://play4guidance.cetic.liuc.it> -

To enter the system you must register your profile through the **registration form**:

A screenshot of the registration form on the Play4Guidance website. The form is titled 'REGISTRATION' and includes the following fields: Username, Password, Confirm password, E-mail, First name, Last name, a checkbox for 'I do not act for a team' (checked), Team name, Country (dropdown), Age (dropdown), Job (dropdown), Sex (radio buttons for Male and Female), and Education (dropdown). At the bottom of the form are 'Reset' and 'Send' buttons.

- Registration form -

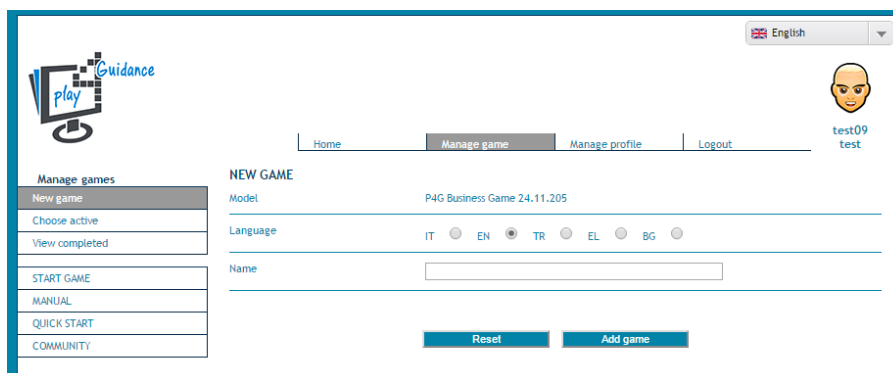
After registration, a confirmation email will be sent in your mailbox.



- Home Page -

In the top menu of the Home Page you can find the main functions of the system: “Manage Game” and “Manage Profile”. The central menu offers a quick access to start a game, links to game’s documentation (Manual and Quick Start) and to access to the Community support.

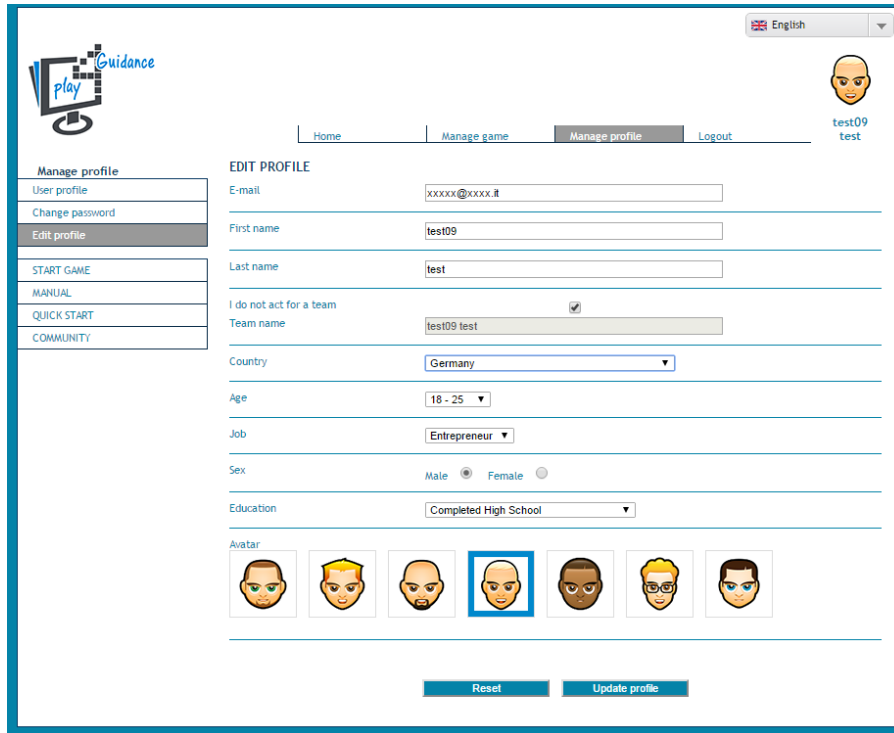
The function "Manage Game" opens the following screen:



- Manage Game -

To create a “New Game” session the player must select the *language* and chose a *name*. Select “Chose Active” or “View completed” to access current game sessions or completed ones.

The function “**Manage Profile**” opens the following screen:

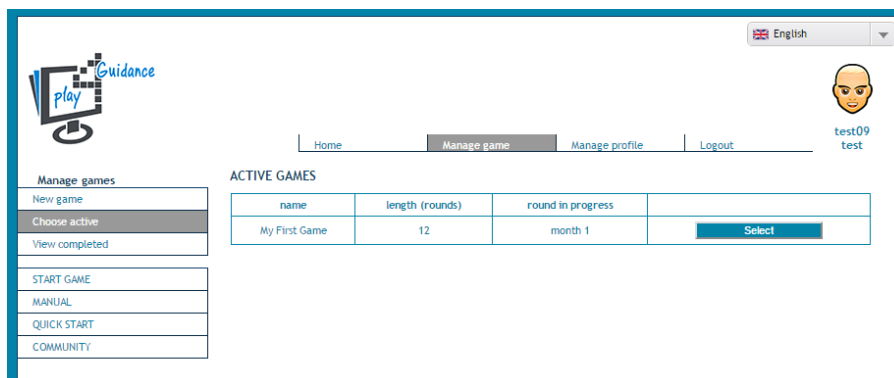


- Manage Profile -

From the submenu on the left of the page, you can *change your password* to access the system and **edit your data profile**.

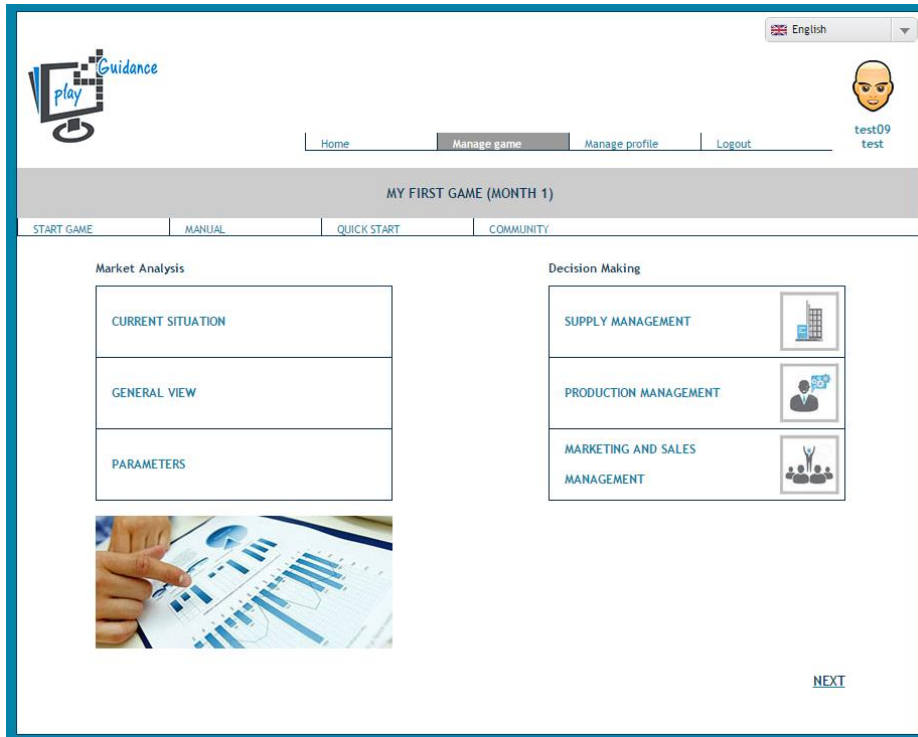
The function "**Logout**" to exit the system.

To start the game click on “**Choose Active**” and select the row related to the game session.



- Active Games -

From the Home page of the Game:



- select **Market Analysis** submenus to access current information data on the market and on your business;
 - select **Decision Making** submenus to insert your decisional variables.
- Click “Next” to access Market Analysis Page.

The Market Analysis page:

Supply Management Results	
Raw material purchased from local supplier (kg)	650
Raw material purchased from foreign supplier (kg)	0
Total purchase cost of the raw material (Euro)	9,750

- Market Analysis -

The buttons in the left section "**Last round results**", displays in the bottom part of the screen the data (organized in groups: Supply Management, Production Management ...) linked to the previous round in the current session.

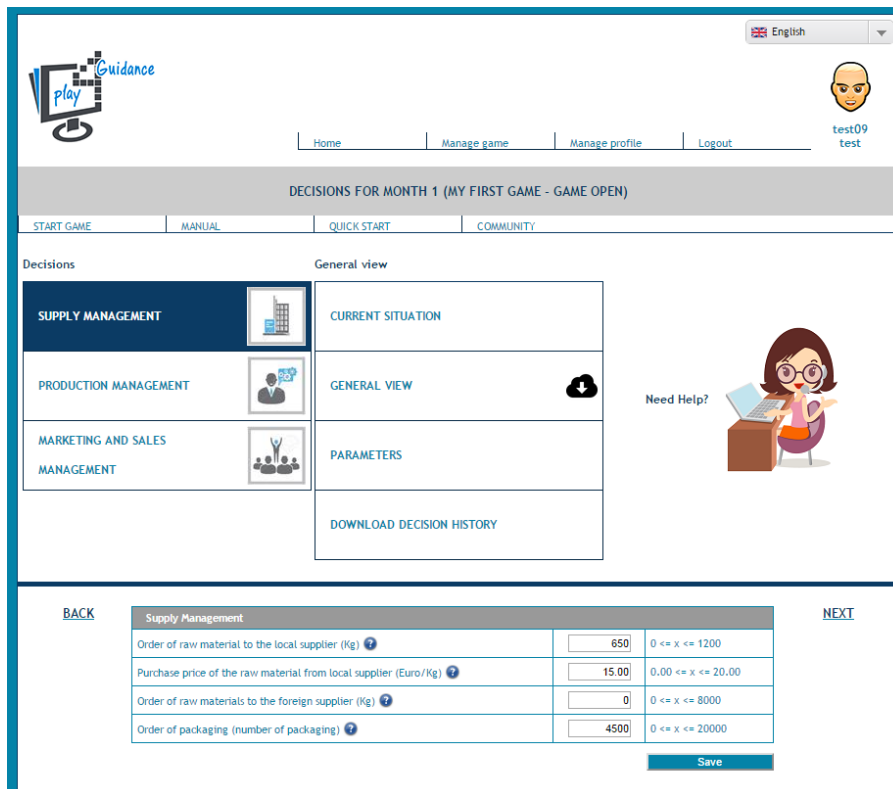
The buttons in the center section "**General view**", displays in the bottom part of the screen the data (general view, parameters, and decision history) from all the rounds already played in the current session.¹

Both these pages have a list of variables with their values. Selecting the *icon* to the left of the name of each variable, a **histogram** is displayed with the history of the values for that variable. Selecting the *question mark* (?), a **text explanation** of the variable is displayed.

The graphic in the right section "**Ranking List**", shows the ranking of the "**Value of the company**" at the current round. In yellow the player position.

Click "**Next**" to access **Decision Making Page**.

The **Decision Making** page:



The buttons in the left section "**Decisions**", displays in the bottom part of the page where to enter data (grouped by type: Supply Management, Production Management ...) for the current round.

On this page, the player communicates its decisions to the system by click "**Save**". At this point, it is important to note that:

- the **values** that are proposed initially for decisions are always the **same** as those selected in the previous round except for some variables (for example, "Assumption and Dismissal"), which are always zero;

¹ The *General View* and the *Decision History* data can be downloaded in a .csv format and imported in an Excel File.

- the data entered in the fields on the page are not saved until you click the "Save" button at the end of the page; as a result, if the data are written and you select "Next", without selecting "Save" before, the data are lost;
- during a round of play, the "Save" button can be selected more than once, to store the data in this way as they are typed.

The buttons in the center section "General view", displays in the bottom part of the page the data (general view, parameters, and decision history) from all the rounds already played in the current session.

During some rounds of play, the player can access to a further *Help Contents* by clicking the "Need Help" function in the right top section of the page.

At the end of the decisional process, the system requires a final confirmation showing the global summary of all decisional values:

BACK	Supply Management		CONFIRM DECISIONS - END ROUND
Order of raw material to the local supplier (Kg) ?	<input type="text" value="650"/>	$0 \leq x \leq 1200$	
Purchase price of the raw material from local supplier (Euro/Kg) ?	<input type="text" value="15.00"/>	$0.00 \leq x \leq 20.00$	
Order of packaging (number of packaging) ?	<input type="text" value="4500"/>	$0 \leq x \leq 20000$	
Production Management			
Quantity of raw material to be processed (kg) ?	<input type="text" value="630"/>	$x \geq 0$	
Purchase of new machines (number of machines) ?	<input type="text" value="0"/>	$0 \leq x \leq 5$	
Payment cash machines / postponed ?	Deferred payment		
Assumptions (number of workers) ?	<input type="text" value="0"/>	$0 \leq x \leq 12$	
Dismissal ?	No layoff		
Expenditure on training (Euro) ?	<input type="text" value="0"/>	$0 \leq x \leq 50000$	
Technology expenditures to improve efficiency (Euro) ?	<input type="text" value="0"/>	$0 \leq x \leq 50000$	
Technology expenditures to improve the effectiveness (Euro) ?	<input type="text" value="0"/>	$0 \leq x \leq 50000$	
Marketing and sales management			
Supply of finished products to the store (number of products) ?	<input type="text" value="0"/>	$x \geq 0$	
Sale price of a finished product to stores (Euro) ?	<input type="text" value="80.00"/>	$60.00 \leq x \leq 120.00$	
Offer high quality finished products to hypermarkets (number of products) ?	<input type="text" value="0"/>	$x \geq 0$	
Offer of finished products of medium quality to hypermarkets (number of products) ?	<input type="text" value="4500"/>	$x \geq 0$	
Sale price of a finished product to hypermarkets (Euro) ?	<input type="text" value="25.00"/>	$15.00 \leq x \leq 40.00$	
Advertising expenditures (Euro) ?	<input type="text" value="0"/>	$0 \leq x \leq 50000$	
Purchase of market data (Euro) ?	No Purchase		

- Confirm Decisions -

After confirmation, the system shows the next round's values and the player can go on with the game. In order to collect data for the automatic **Competences Assessment** tool, included in the game, the system could ask to the player to answer to some *questions*.

Below an example of this kind of questions.

English

test09
test

[Home](#) | [Manage game](#) | [Manage profile](#) | [Logout](#)

DECISIONS FOR MONTH 2 (MY FIRST GAME - GAME OPEN)

[START GAME](#) | [MANUAL](#) | [QUICK START](#) | [COMMUNITY](#)

BEFORE CONTINUING ANSWER THESE SHORT QUESTIONS...

In the process of raw material acquisition, how many type of suppliers are available?

One
 Two
 More
 I do not know

[SAVE AND GO TO THE NEXT ROUND](#)

- Question Example-

Data dictionary

The strategy of the company is realized by making choices in relation to the three business areas:

- *the management of supply*, which has as its objective the management of the acquisition process of the raw material from suppliers and inventory management of raw material, in order to maintain a level of stocks consistent with the chosen strategy;
- *the management of the production*, which has as its objective the management of the transformation process from raw material to finished product, so as to maintain a level of stocks in the warehouse of the finished products, divided into products of high quality and medium quality, consistent with the strategy chosen; the amount of processed raw material is dependent on various factors, including the performance of the raw material itself, the availability of labor (workers and machinery) and the level of training of the workers;
- *the management of marketing and sales*, which aims to position the company on the market of end customers through a double channel of the stores and hypermarkets, choosing, in addition to the quantity and price of the finished products, including the degree spending devoted to expenditure on advertising. It should also be noted that each finished product can be sold only if packed in a package.

Each of these areas has the characteristic elements of the company and the market, which must be taken into account to make the appropriate choices in order to maximize the target variable: the value of the firm.

Here are presented the most relevant information for each of the variable characteristics of each of the three areas, categorized variables related to:

- decision-making;
- the results obtained;
- market data;
- the operating parameters.

Finally the other two sections are related, which include, respectively, the variables related to the overall management and data that can be obtained with market research.

Target Variable

Total value of the company

Unit: *Euro*

Total value of the company, including both assets viability of both contributions due to investments made during the year. These contributions are valued according to the principle that a company that invests in staff, hiring new workers and improving the training of workers employed, and in technology increases its value.

01. Supply Management

Decision

Order of raw material to the local supplier

Unit: *kg*

Minimum value: 0

Maximum value: 1200

Initial value: 650

Quantities of raw materials to be ordered to the local supplier.

The amount actually obtained the order will be delivered the following month. The number of finished products achievable with a unit of raw material is specified by the number of finished products per unit of raw material.

Purchase price of the raw material from local supplier

Unit: *Euro/kg*

Minimum value: 0

Maximum value: 20

Initial value: 15

Purchase price offered to local supplier for a unit of raw material.

The local market upstream is characterized by a shortage of raw material, and order fulfillment depends, therefore, by the total amount of orders of all companies in the market. Based on the relationship between:

X = total amount of raw material required by companies

Y = quantity of raw material made available from local supplier

you give two cases:

- In the case where X is less than or equal to Y , all orders will be processed completely;
- In the case where X is greater than Y , the orders made will be reduced according to the purchase price, a purchase price greater than that of the competitors allows to obtain a quantity of raw material similar to that ordered.

Is provided a minimum reference price, under which the local provider is willing to sell the raw material only in quantity gradually reduced.

Order of raw materials to the foreign supplier

Unit: *kg*

Minimum value: 0

Maximum value: 8000

Initial value: 0

Quantities of raw materials to be ordered to the foreign supplier.

The raw material is transported by container. This type of order can only be done at certain times. Because of the length of the journey, the raw material ordered will be delivered to the warehouse of the raw material only two months after the order. Is instead required to pay the order.

The number of finished products achievable with a unit of raw material is specified by the number of finished products per unit of raw material.

Order of packaging

Unit: *number of packaging*

Minimum value: 0

Maximum value: 20000

Initial value: 4500

Number of packages to order.

Each finished product must be packaged with a packaging in order to be sold. This implies that a shortage of packaging in its warehouse prevents the sale of finished products.

Results

Raw material purchased from local supplier

Unit: *kg*

Quantity of raw material delivered by the local supplier.

Since the upstream local market is characterized by a shortage of raw materials, the orders made in the previous month cannot be processed completely.

Suggestion

A purchase price greater than the competition allows to make a quantity of raw material increased.

Raw material purchased from foreign supplier

Unit: *kg*

Quantity of raw material delivered by the foreign supplier.

Total purchase cost of the raw material

Unit: *Euro*

Total cost incurred for the purchase of raw materials, including spending by both the local supplier is from foreign supplier.

Stock inventory of raw material

Unit: *kg*

Storage of the raw material in its warehouse.

The raw material delivered by suppliers is stored in this stock, before being processed and converted into finished products.

Weighted average cost per unit of raw material

Unit: *Euro/kg*

Weighted average cost per unit of raw material.

Calculated according to the stock at the warehouse and its purchase price, is used for the evaluation of this stock.

Purchase cost of packaging

Unit: *Euro*

The cost incurred for the purchase of packaging.

Stock inventory of packaging

Unit: *number of packaging*

Storage of packaging in its warehouse.

The packaging purchased are stored in this stock, before being used, just before delivery to the customers, for the packaging of the finished products.

Market data

Minimum price of the raw material accepted by the local supplier

Unit: *Euro*

Minimum value: 0

Maximum value: 13.5

Indicative price that the local supplier is willing to accept to sell a unit of raw material.

Below this price, the local provider is willing to sell the raw material only in quantity gradually reduced.

Exchange Dollars US / Euro

Unit: *Dollars US/Euro*

Initial value: 1.25

Indicative exchange ratio between the currency requested by the foreign supplier (Dollars US) and local currency (Euro).

Indicative price for the rental of a container

Unit: *Dollars US*

Minimum value: 0

Initial value: 15000

Indicative price, foreign currency, to be incurred to rent each container required for the delivery of raw materials purchased by the foreign supplier.

The maximum amount of raw material contained in a container is specified by the parameter capacity of a container.

The exchange rate between the currency shall be made at no additional cost to the ratio specified by the Exchange Dollar US / Euro.

Indicative price of the raw material from overseas supplier

Unit: *Dollars US/kg*

Minimum value: 0

Initial value: 10

Indicative price, foreign exchange, a unit of raw material purchased from foreign supplier.

This price does not include the rental cost of the transport container, specified by the variable Indicative price for

the rental of a container.

The exchange rate between the currency shall be made at no additional cost to the ratio specified by the Exchange Dollar US / Euro.

Wholesale purchase price of packaging

Unit: *Euro*

Initial value: 1.5

Unit purchase price of packaging in the case of bulk orders, that is, in significant quantities.

The minimum value of packaging in order to purchase wholesale is specified by the Minimum quantity of packaging purchased wholesale.

Purchase price retail packaging

Unit: *Euro*

Initial value: 3

Unit purchase price of packaging in the case of retail orders, that is, in small quantities.

The minimum value of packaging in order to purchase wholesale is specified by the Minimum quantity of packaging purchased wholesale.

Operating parameters

Capacity of a container

Unit: *kg*

Value: 4000

Maximum quantity of raw material that can be contained in a container.

Minimal amount of packaging purchased wholesale

Unit: *number of packaging*

Value: 4000

Minimal amount of packaging purchased wholesale.

The purchase of a smaller number of packaging is considered to detail, with a consequent increase in the unit price.

02. Production management

Decisions

Quantity of raw material to be processed

Unit: *kg*

Minimum value: 0

Initial value: 630

Quantity of raw material to be processed, in order to realize finished products to be stored in the corresponding stock.

The processes depend on the stocks in the stock of the raw material, and are at most equal to the production capacity, which in turn is determined by the number of machines and the number of workers. Each unit generates the processed raw material of the production costs, which can be reduced by making investments in technological innovations.

Purchase of new machines

Unit: *number of machines*

Minimum value: 0

Maximum value: 5

Initial value: 0

Number of new machinery that will be delivered and put into operation the following month.

Negative values are not allowed, that is not the possibility to dispose of the machinery. Since each machine must be used by a certain number of workers, the number of machines that can be used depends on the number of

workers actually available, that is not assigned to other machines, at the time of purchase.

And 'possible to buy a machine without the number of workers needed to operate it; in this case the machine will be acquired but not used, and therefore will not bring an increase in productivity. The purchase of equipment is an investment that increases the overall value of the company.

Payment cash machines / postponed

Possible value: "post-pay payment" "Cash payment"

Possibility to postpone the payment of the machinery to the next month.

If the machinery is paid in post-pay payment, the cost, charged the following month, will be increased by 5%.

Assumptions

Unit: *number of workers*

Minimum value: 0

Maximum value: 12

Initial value: 0

Specifying a number greater than zero indicates the number of workers you plan to hire during the month.

The number of workers directly affects the company's production capacity.

Dismissal

Possible value: "No dismissal" "Dismissal of a worker"

The layoffs are to adversely affect the level of turnover, which is taken into account when calculating the value of the company.

In every month you can still fire at most one worker.

The number of workers directly affects the company's production capacity.

Expenditure on formation

Unit: *Euro*

Minimum value: 0

Maximum value: 50000

Initial value: 0

Spending on formation the workforce improves the competence of the workers, thereby increasing both the effectiveness and the efficiency of production, and then, respectively, the fraction of the finished products of the highest quality on the total of finished products manufactured and the number of products finished made per unit of raw material.

To determine the value of the formation of the workers, every month is rated the Fund for the costs of formation, which contains the cumulative expenditure incurred and comparing it with the annual expenditure for formation multiplied by the number of workers hired.

Technology expenditures to improve energy

Unit: *Euro*

Minimum value: 0

Maximum value: 50000

Initial value: 0

Monthly expenditure for technological innovations aimed at improving efficiency.

These innovations allow you to:

- Reduce the processing costs per unit of raw material processed;
- Increase the number of finished products made per unit of raw material.

The effect of these innovations is manifested as of next month, and for all the months following, however, halved with each passing month.

You get the maximum benefit when the indicator of investment in technology for maximum efficiency is (1.0). To get the maximum value of the indicator, the Fund expenses in technology for efficiency must be equal to expenditures in technology necessary for efficiency for each month of the year.

Suggestion

Is possible to reduce the cost of processing unit 50% of its value, bringing the indicator of costs in technology for efficiency to the maximum.

Technology expenditures to improve the effectiveness

Unit: *Euro*

Minimum value: 0

Maximum value: 50000

Initial value: 0

Monthly expenditure for technological innovations aimed at improving the effectiveness.

These innovations allow you to increase the fraction of the finished products of the highest quality on the total of finished products manufactured.

The effect of these innovations is manifested as of next month, and for all the months following, however, halved with each passing month.

You get the maximum benefit when the indicator of investment in technology for maximum effectiveness (1.0). To get the maximum value of the indicator, the Fund expenses in technology for effectiveness must be equal to expenditures in technology necessary for effectiveness for each month of the year.

Results

Quantity of raw material actually worked

Unit: *kg*

The amount of raw material actually processed depends on the warehouse stocks of raw material and the production capacity.

Thanks to the activity of manufacturing the finished products are made, which are then stored in the warehouses of finished products, high or medium quality. From each unit of raw material processed is realized a number of finished products equal to the number of products per unit of raw material.

Suggestion

To increase the production of finished products can act on the yield of the raw material: performing of costs in the formation increases the value of the number of products per unit of raw material.

Finished products of high quality made

Unit: *number of products*

Number of high-quality finished products actually made.

Stock inventory of finished products of high quality

Unit: *number of products*

Number of finished products of high quality in the warehouse and ready to be sold, after being packaged.

Finished products made of medium quality

Unit: *number of products*

Number of finished products of medium quality actually made.

Stock inventory of finished products of medium quality

Unit: *number of products*

Number average quality of finished products in the warehouse and ready to be sold, after being packaged.

Production capacity

Unit: *kg*

Maximum quantity of the raw material processable each month.

Depends on the number of workers and the number of machines. Each worker is able to work a quantity of raw material equal to the capacity manual, while a machine is able to work a quantity of raw material equal to the capacity with machinery.

Processing cost per unit

Unit: *Euro/kg*

The processing of one unit of raw material has a cost related to the energy used.

Because this value includes miscellaneous costs due to inefficiencies in production, it can be reduced by investing in technological innovations aimed efficiency.

Suggestion

Is possible reduce this cost by 50% of its value to the maximum value bringing the indicator of costs in the technology for efficiency.

Weighted average cost per unit of finished products

Unit: *Euro/product*

Weighted average cost per unit of finished products.

Calculated based on the costs of the raw materials, personnel and processing, is used for the evaluation of the stock of the warehouses of the finished products.

Number of finished products per unit of raw material

Unit: *number of products/kg*

Minimum value: 7

Maximum value: 9

Initial value: 7

Production efficiency, in terms of the number of finished products made per unit of raw material.

This value can be increased with expenses in formation or technology.

Machines company

Unit: *number of machines*

Number of machines present in the company.

Workers company

Unit: *number of workers*

Number of workers employed in manufacturing.

Fund for the costs of formation

Unit: *Euro*

Minimum value: 0

Fund for the costs of training the workforce.

The costs in formation allow to increase in proportion of the processing capacity of the raw material, thus obtaining a greater number of finished products from one unit of raw material.

Market data

Salary

Unit: *Euro*

Minimum value: 800

Maximum value: 1600

Initial value: 1000

Monthly salary paid to each worker employed.

Rent sheds

Unit: *Euro*

Minimum value: 5000

Initial value: 10000

Monthly cost for renting sheds.

Cost of electricity

Unit: *Euro/kg*

Minimum value: 10

Maximum value: 20

Initial value: 16

Approximate cost of the energy used in the production per unit of raw material.

Unforeseen events

Unit: *Euro*

Minimum value: 0

Initial value: 0

Cash flows due to unforeseen events of various kinds.

Operating parameters

Manual capacity

Unit: *kg*

Value: 10

Quantity of raw material that a worker can work manually in a month.

Suggestion

A worker has a production capacity equal to the capacity manual. Two workers have therefore a production capacity of twice the capacity manual. Two workers that use a machine have a production capacity equal to the capacity with machinery added to double the capacity manual.

Capacity with machines

Unit: *kg*

Value: 50

Quantity of raw material that a worker can work using machines additionally compared to its ability manual.

Suggestion

See Capacity Manual.

Purchase cost of a machine

Unit: *Euro*

Value: 30000

Cost to be incurred for the purchase of a new machine.

Number of workers for machine

Unit: *number of workers*

Value: 2

Number of workers needed for the operation of a single machine.

Minimum number of products per unit of raw material

Unit: *number of products/kg*

Value: 7

Minimum yield of one unit of raw material.

Represents the minimum number of finished products that can be obtained by working unit of raw material. The current value is indicated by the number of products per unit of raw material.

Suggestion

Is possible increase the value of the number of products per unit of raw material costs in carrying out the formation. Not doing instead no expense in formation performance is equal to the minimum number of products per unit of raw material.

Maximum number of products per unit of raw material

Unit: *number of products/kg*

Value: 9

Maximum yield of one unit of raw material.

Represents the maximum number of end products that can be obtained by working unit of raw material. The current value is indicated by the number of products per unit of raw material.

Suggestion

Is possible increase the number of products per unit of raw material costs in carrying out the formation.

Additional charge for post-pay payment of machines

Unit: *percentage*

Value: 0.05

Additional change percentage to be incurred for the purchase of new machines in the case of post-pay payment.

Annual expenditure on trainingUnit: *Euro*

Value: 10000

Cost that would be incurred annually for the training of each worker in order to maximize its competence.

The training allows to reduce the processing waste and thus to increase the yield of one unit of raw material.

Expenditures on technology necessary for efficiencyUnit: *Euro*

Value: 25000

Charges in technology required to maximize the efficiency of production, in order to reduce the processing costs per unit of raw material processed and increase the number of finished products made per unit of raw material.

Expenditures on technology necessary for effectiveUnit: *Euro*

Value: 25000

Expenditures in technology necessary to maximize the effectiveness of production, in order to increase the fraction of finished products of high quality on the total of the finished products made.

Interest rate activeUnit: *percentage*

Value: 0.0020

Interest rate active, paid monthly on the current account of the company in the event that the available funding is positive.

Interest rate liabilitiesUnit: *percentage*

Value: 0.005

Interest rate liabilities, charged monthly on the current account of the company in the event that the financial availability is negative.

03. Management of marketing and sales**Decisions****Supply of finished products to the store**Unit: *number of products*

Minimum value: 0

Initial value: 0

Number of finished goods offered for sale in stores.

Through this channel may be sold only high quality products, already present in the warehouse of finished products, and for each of which there is a packing. The number of products actually sold depends on the market conditions and the level of competitiveness of the company, as shown in the description of the sales price of a finished product to stores.

This variable does not affect the level of competitiveness.

Sale price of a finished product to storesUnit: *Euro*

Minimum value: 60

Maximum value: 120

Initial value: 80

Sale price of a single finished product to the stores.

The stores agree to sell only high quality products.

The downstream market is characterized by a shortage of demand for finished products, and the number of finished products actually sold therefore depends from the total supply of all companies in the market. Based on the relationship between:

X = total number of finished products offered by companies

Y = number of finished products required by the market

you give two cases:

- In the event that X is less than or equal to Y , all products will be sold, provided that their sale price does not exceed the maximum sale price accepted in the stores;
- In the case where X is greater than Y , the number of products sold will depend on the offer reduced inversely carried out according to the company's competitiveness.

This price is one of the factors that influence on the index of competitiveness in the valley, along with the advertising expenses incurred in the month and the progression of technology investments.

The market is regulated by a propensity to spend characterized by a curve with a slope and date with a maximum price equal to the maximum sale price accepted in stores.

Suggestion:

Competitiveness is influenced directly by the sale price, the advertising expenses and product quality. Given a sales strategy (with a certain price), to increase competitiveness can increase spending on advertising and technology. The latter allow to obtain products of superior quality.

Offer of high quality finished products to hypermarkets

Unit: *number of products*

Minimum value: 0

Initial value: 0

Number of high-quality finished products offered for sale in hypermarkets.

Through this channel may be sold products both high, medium quality, already present in the warehouse of the finished products, and not yet in production, and to each of which is provided a packing. The number of products actually sold depends on the market conditions and the level of competitiveness of the company, as shown in the description of the sales price of a finished product to stores.

This variable does not affect the level of competitiveness.

Offer of finished products of medium quality to hypermarkets

Unit: *number of products*

Minimum value: 0

Initial value: 4500

Number of finished products of medium quality on sale in hypermarkets.

Through this channel may be sold products both high, medium quality, already present in the warehouse of the finished products, and not yet in production, and to each of which is provided a packing. The number of products actually sold depends on the market conditions and the level of competitiveness of the company, as shown in the description of the sales price of a finished product to hypermarkets.

This variable does not affect the level of competitiveness.

Sale price of a finished product to hypermarkets

Unit: *Euro*

Minimum value: 15

Maximum value: 40

Initial value: 25

Sale price of a single product to hypermarkets.

Hypermarkets agree to sell products both high average quality, but require that the asking price is the same.

Market conditions are described in the documentation of the variable price of sale of a finished product to stores.

Advertising expenditures

Unit: *Euro*

Minimum value: 0

Maximum value: 50000

Initial value: 0

Amount for the marketing campaign.

The campaign produces effects in a single month, increasing market competitiveness final. The effect of the

campaign, in terms of increased competitiveness, depends on the difference between advertising spending and the average advertising expenses incurred by the other companies for the month under consideration.

Purchase of market data

Possible values: "No purchase" "Basic Package" "Package extended"

Expenditure for the purchase of the results of market research, referring to the previous month.

They can be purchased two different data packets, one basic and one extended: the second largest cost, includes data from the first. The cost of the two packages is specified in the documentation of the parameters Cost of market research and the basic cost of extensive market research.

The basic package includes the following data:

- Total amount of raw material made available by the local supplier;
- Number of finished products that the overall end-user market, through both stores both hypermarkets, has been able to absorb.

The extended package contains the data of the basic package and in addition the following:

- The minimum, average and maximum purchase prices offered by the companies to the local supplier per unit of raw material;
- The minimum, average and maximum quantity of raw material prices ordered the foreign supplier;
- Average value of existing stocks of raw material in the warehouses of the companies;
- Average value of existing stocks of finished products of high and medium quality in the warehouses of the companies;
- The minimum, average and maximum sales prices required by the companies to end customers for the finished product, both in stores both in hypermarkets;
- The minimum, average, and maximum of advertising expenses incurred by companies.

Results

Finished products sold in stores

Unit: *number of products*

Quantity of finished products actually sold in stores.

Since the final market is characterized by a shortage of the request of the finished products, the products offered cannot entirely be purchased from the market.

Revenue of the month from stores

Unit: *Euro*

Revenue of the month, achieved thanks to the sale of finished products in stores.

Finished products sold in hypermarkets

Unit: *number of products*

Quantity of finished products actually sold in hypermarkets.

Since the final market is characterized by a shortage of the request of the finished products, the products offered cannot entirely be purchased from the market.

Revenue of the month hypermarkets

Unit: *Euro*

Revenue of the month, achieved thanks to the sale of finished products in hypermarkets.

Market data

Maximum sale price accepted in stores

Unit: *Euro*

Minimum value: 0

Initial value: 100

Highest price that the market is willing to incur to acquire a finished product at a shop.

Maximum sale price accepted in hypermarketsUnit: *Euro*

Minimum value: 0

Initial value: 35

Highest price that the market is willing to incur to acquire a finished product at a hypermarket.

Operating parameters

Cost of market research baseUnit: *Euro*

Value: 20000

Cost of acquisition of the data packet basis obtained from market research.

The data purchased are specified in the documentation of the variable purchase of market data.

Cost of extensive market researchUnit: *Euro*

Value: 50000

Purchase cost of the package of extended data obtained from market research.

The data purchased are specified in the documentation of the variable purchase of market data.

04. Overall results of management

Results

Financial availabilityUnit: *Euro*

Financial availability, derived from the sum of the current account balances, bank loans and interest income / expense.

Loans are unlimited, allowing companies to operate with overdrafts. In relation to the current account balances, monthly are credited / debited interests.

Suggestion:

It should be maintained any debt under control, in order to avoid failure.

Interests on the current accountUnit: *Euro*

Interest on current account.

- The percentage of interest income that are paid monthly is specified by the rate of active interest.

- The rate of interest payable monthly payment is specified by the rate of interest payable.

Labor costUnit: *Euro*

Monthly cost of labor, obtained from the sum of the wages of all workers currently employed.

Accounts payable to suppliersUnit: *Euro*

Amounts payable to suppliers machines.

These debts are generated if you choose to pay arrears machine.

The following month, on payment of the machine, the debt is extinguished.

Fund expenditures on technology for efficiencyUnit: *Euro*

Initial value: 0

Fund expenses made in technology and designed to improve efficiency.

This fund accumulates expenses in technology made monthly for efficiency, reduced the rate of reduction rate of

the fund monthly expenses in technology.

Suggestion:

You get the full advantage of such innovations as the indicator of costs in technology efficiency is maximum (1.0). To get the maximum value of the indicator, this fund must be equal to expenditures in technology necessary for efficiency for each month of the year. Higher values of this fund does not bring additional benefits, while lower values lead to a proportionately lower value Indicator of expenses in technology for efficiency.

Fund expenditures on technology for effectiveness

Unit: *Euro*

Initial value: 0

Fund expenses made in technology and designed to improve the efficiency.

This fund accumulates expenses in technology made monthly for effectiveness, reduced the rate of reduction rate of the fund monthly expenses in technology.

Suggestion:

You get the full advantage of such innovations as the indicator of costs in technology for maximum effectiveness (1.0). To get the maximum value of the indicator, this fund must be equal to expenditures in technology necessary for effectiveness for each month of the year. Higher values of this fund does not bring additional benefits, while lower values lead to a proportionately lower value Indicator of expenses in technology for effectiveness.

Indicator of expenditures on technology for efficiency

Unit: *index*

Indicator of expenditure incurred in technology aimed at improving efficiency.

These innovations allow you to:

- Reduce the processing costs per unit of raw material processed;
- Increase the number of finished products made per unit of raw material.

The effect of innovations is manifested from the following month.

Suggestion:

To get the maximum value of this indicator (1.0), the Fund expenses in technology for efficiency must be equal to expenditures in technology necessary for efficiency for each month of the year. Is possible to reduce the cost of processing unit 50% of its value, bringing this indicator to the maximum value.

Indicator of expenditures on technology for effectiveness

Unit: *index*

Indicator of expenditure incurred in technology aimed at improving the effectiveness.

These innovations allow you to increase the fraction of the finished products of the highest quality on the total of finished products manufactured.

The effect of innovations is manifested from the following month.

Suggestion :

To get the maximum value of this indicator (1.0), the Fund for expenses in technology effectiveness must be equal to expenditures in technology necessary for effectiveness for each month of the year.

05. Market research

Market data

Supply of raw materials from local supplier

Unit: *kg*

Total amount of raw material made available by the local supplier during the month.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Minimum purchase price from local supplier

Unit: *Euro*

Minimum value between the purchase prices offered by companies to the local supplier per unit of raw material. This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Average purchase price from local supplier

Unit: *Euro/company*

Average value of the purchase prices offered by companies to the local supplier per unit of raw material.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Maximum purchase price from local supplier

Unit: *Euro*

Maximum value between the purchase prices offered by companies to the local supplier per unit of raw material.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Minimum quantity of raw material ordered to the foreign supplier

Unit: *Euro*

Minimum value of the quantity of raw material ordered the foreign supplier.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Average amount of raw material ordered to the foreign supplier

Unit: *kg/company*

Mean value of the quantity of raw material ordered the foreign supplier.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Maximum quantity of raw material ordered to the foreign supplier

Unit: *Euro*

Maximum value of the quantity of raw material ordered the foreign supplier.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Average value of stocks of raw material in warehouses

Unit: *kg/company*

Average value of existing stocks of raw material in the relevant warehouse companies.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Average number of machines

Unit: *number of machines/company*

Average number of machines used in the production by the companies.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Average expenditure on technology for efficiency

Unit: *Euro/company*

Average value of the costs in technology to improve efficiency made by the companies.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Average expenditure on technology for efficiency

Unit: *Euro/company*

Average value of the costs in technology to improve the effectiveness made by companies.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Total number of workers employed

Unit: *number of workers*

Total number of workers employed in the production by the companies.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Average value of the inventory of finished products of high quality

Unit: *number of products/company*

Average value of existing stocks of finished products of the highest quality in the warehouses related companies.

This data is only available by purchasing the results of a market survey, refer to the current month (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Average value of the inventory of finished products of medium quality

Unit: *number of products/company*

Average value of existing stocks of finished products of average quality in the warehouses related companies.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Minimum sale price in stores

Unit: *Euro*

Minimum of sales prices in stores required by the companies to end customers for the finished product.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Average sale price in stores

Unit: *Euro/company*

Average value of sales prices in stores required by the companies to end customers for the finished product.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Maximum sale price in stores

Unit: *Euro*

Maximum value of sales prices in stores required by the companies to end customers for the finished product.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Capacity of the final market through stores

Unit: *number of products*

Number of finished products that the overall end-user market was able to absorb in the month through stores.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Minimum sale price in hypermarkets

Unit: *Euro*

Minimum value of sales prices in hypermarkets required by the companies to end customers for the finished product.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A value of 0 means that the package has not been purchased.

Average sale price in hypermarkets

Unit: *Euro/company*

Average value of sales prices in hypermarkets required by companies to end customers for the finished product.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A

value of 0 means that the package has not been purchased.

Maximum sale price in hypermarkets

Unit: *Euro*

Maximum value of sales prices in hypermarkets required by companies to end customers for the finished product.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A

value of 0 means that the package has not been purchased.

Capacity of the final market through hypermarkets

Unit: *number of products*

Number of finished products that the overall end-user market was able to absorb in the month through hypermarkets.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A

value of 0 means that the package has not been purchased.

Minimum expenditure on advertising

Unit: *Euro*

Minimum value of the expenditure made by companies in advertising.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A

value of 0 means that the package has not been purchased.

Average expenditure on advertising

Unit: *Euro/company*

Average value of the expenditure made by companies in advertising.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A

value of 0 means that the package has not been purchased.

Maximum expenditure in advertising

Unit: *Euro*

Maximum value of the expenditure made by companies in advertising.

This data is only available by purchasing the results of market research (see variable Purchase of market data). A

value of 0 means that the package has not been purchased.