CESIM SIMFIRM
Introduction

Simulation for general business management
**What is Cesim SimFirm?**

*Cesim SimFirm* is an online business simulation game that develops students’ understanding of the complexity of business operations in a competitive environment.

It integrates a range of concepts from various management related disciplines, including marketing, production, logistics, and financial decision-making. In addition, it links the organization to the wider context of business world and stakeholders.

The task for the student teams is to manage the sales and operations of an international pharmaceutical company. Key success factors include accurate forecasting and planning, analytical approach to decision-making, and good teamwork.
Learning Goals

To increase the participants awareness of operating a company from a general management perspective.

To help the students recognize the interactions among the various companies and external influences in a complex and interrelated environment.

To increase the students’ capability to interpret and forecast market situations and market results and translate them into goal-oriented decisions.

To enhance fact based analytical decision making by linking the decisions to cash flows and bottom line performance.

To give students practical experience in teamwork and problem solving while exciting competitive spirits in a dynamically evolving marketplace.
Learning Process

Concrete experience
- Decision making

Applying new ideas
- Analysis & planning

Observations & reflections
- Results & teamwork

Generalizing from the experience
- Lectures & discussion

Concrete experience
- Decision making

Applying new ideas
- Analysis & planning

Observations & reflections
- Results & teamwork

Generalizing from the experience
- Lectures & discussion
The simulation is completely web based. There is no need to install any separate applications and the simulation can be accessed from any computer that has an internet connection.

The simulation platform allows team members to work virtually if they wish. Each team member has her/his own account that enables them to make decisions and scenarios on their own and later combine the outcomes with the other team members on the [decision checklist] - page.

The platform also includes a communications forum that can be used to communicate within teams and between all teams in one market.
Simulation Platform Structure

The simulation platform includes the following pages:

[Home] - Overview page with deadlines

[Decisions] - All decisions are made under 'Decisions'

[Results] - Results become available in this area after each deadline

[Schedule] - Simulation schedule is available on this page

[Teams] - Teams and team members in your market can be viewed here

[Communications] - Access to the discussion forums for team and market

[Readings] - Access to the decision making instructions and case description
Each simulation market consists of 2-12 teams, with 1-8 members in each. The number of parallel simulation markets is not limited, making it possible to utilize the simulation for any number of students in the class.

All teams are starting from exactly the same position, with similar market shares and profits. Equally, teams will face the same market conditions during the simulation.

Note that the teams compete against other teams in their own market, not against a computer. The decisions of each team influences the other teams’ results and the market development overall.
The instructor has the option to limit the products, markets, and production areas. In addition, the instructor can decide to include or exclude financial decision-making modules for working capital and/or shares.

If you want to utilise any of the case management options you need to go to [Case management] – page and click tab ”Your parameter sets”. Then follow these steps:

1. Click ”Create new simulation parameters” and name it. The parameters now appear under ”Your parameter sets”
2. Click ”Parameters” and click the box Modules
3. Make your selections
4. Go back to [Case management], choose tab ”Apply parameters to groups]” and click ”Assign”

Note that you can also change all the other parameters with the same steps as presented above.
1. Go to http://www.cesim.com and choose “Register” on the top right.
2. Fill in your email and other details and select the language and the time zone.
   click <next>
3. Enter the course code that is given by your instructor.
   click <next>
4. Enter license code if required. (Note that if the license code is required you must enter a valid code. Otherwise the registration will not continue.)
   click <next>
5. Choose your Group and Team. Group equals one world where a maximum of 12 teams operate.
   click <next>
6. Click “Finish” and your registration is almost done.
7. Check your email and click the activation link.
8. Login with your email and password at www.cesim.com.
After the introduction, the teams familiarize themselves with the decision making process via a practice round. The results of the practice round will not have any influence on the actual game results.

The instructor decides the number of actual decision making rounds (5-12) and decision making follows the cycle on the right.

Note that it is not possible to modify the decisions after the round deadline. If the team has not saved its decisions for a round, the system will automatically use the results of the previous round.
The main objective for the teams is to deliver **sustainable, profitable growth**. In the simulation this is typically measured by a ratio called “Cumulative earnings”, which shows how much profit the team has made during the simulation rounds.

The instructor may, at his/her discretion, choose to use other criteria to measure the performance of the teams. For example, market shares, accumulated profits, and revenue growth can be used if so decided.

Also, if the instructor has enabled the optional financial module we recommend to use “Cumulative Total Shareholder Return” as the winning criteria. It combines share price development and paid dividends to show the total return to the shareholders.
Decision making is round based. One decision making period is typically regarded as one fiscal year.

In the beginning of the game, so called ‘initial round results’ are available. These can be used as a starting point for the practice round decisions. After the practice round, the simulation is cleared back to the beginning again, and decisions will be made for the first round.

The manual and the case description should be read before the practice round. The market outlooks should be read before starting to make decisions for each round. A new market outlook containing information about the market development becomes available as soon as the previous round has passed.

Remember to save the decisions before the deadline.
Decisions are entered in the **white cells**. These will be used in the actual calculation of the results.

Estimations are entered in the **blue cells**. These will not be used for the calculation of the results, but they are important because together with the decisions they form the basis for the budgets.

Drop-down menus are used in certain decisions where there are some specific options to choose from.

Generally the simulation has two products, three markets, and two production areas. However, the instructor may have limited the number of products, markets, and production areas.

Remember to save the decisions before the deadline.
The team will take over as the new management team of Pillsens Ltd, an international pharmaceutical company. The team is responsible for overseeing the operations and sales of the company’s two over-the-counter (OTC) products, namely Rubbana and AndyOx. Rubbana is a pain killer and AndyOx is a vitamin.

The team is responsible for the sales, production, quality, and logistics of these two products.

Key success factors for the team include; effective utilisation of the pricing, advertising and sales efforts for different markets, and effective logistics and production management.
Demand Structure

Starting situation with 4 teams (example)
In the beginning all teams have exactly the same market share (e.g., 25%).

Total market size is affected by:
- Economic conditions
- Average price level
- Aggregate investments in advertising and customer care
- Aggregate investments product quality

Market shares for each team are affected by:
- Quality of the product
- Price
- Promotion (advertising and customer care)

The above factors are compared between the different teams.

In addition, market shares are influenced by **delivery priority** decisions in case the company’s delivery capability is not sufficient to cover the whole demand for the company’s products.
The company has two products and it operates in three market areas. One of the areas is their home market. The production facilities are located in the home country and area 2.

In the standard case all products and market areas are available from the beginning, but the instructor has an option to limit the products and market areas.

Companies can also sell to bulk-clients, which do not operate in a specific market area. Bulk-clients occasionally make large bids and teams can make offers to those bids.

<table>
<thead>
<tr>
<th>Home, Area 1</th>
<th>Area 2</th>
<th>Area 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product 1</td>
<td>Product 1</td>
<td>Product 1</td>
</tr>
<tr>
<td>Product 2</td>
<td>Product 2</td>
<td>Product 2</td>
</tr>
</tbody>
</table>
Pricing
Prices are set in the currency of the market area. Price sensitivity of customers varies between market areas and products. Customers are sensitive to relative price differences between competitors.

Advertising and customer care
The impact of marketing investments can be different in separate market areas. Budgeting is done in the currency of the company’s home country. Relative marketing efforts between competitors are important in determining effect.

Quality control
The company can improve the quality of its products through quality control investments. The market reaction to quality control differs from market to market.
There is a time lag between the time (t) when the quality control investment is made and when this investment produces improvements on the quality. The impact of these investments is strongest during the year following the investment (t+1) and then begins to fade off after that.
Special pricing for bulk-clients
Companies bid for bulk customers’ purchases. The order size of product 1 or 2 requested by the customers is written in the status report. The bulk-client will accept only one of the bids put forth by the suppliers.

If the bid is accepted the products are delivered with a delay of one accounting period of the bid. The orders of bulk-clients are delivered before selling to the market. Bulk-clients pay a 10 percent down payment the year the contract is made.

Selling and pricing to bulk-clients
The company decides on the price of the bid in its domestic currency. The company also decides the level of promotion put into the bid. The quality of the product (level of product development) also influences the decision to buy. Price is the most important factor in accepting an offer. Bulk-clients are not the same year in year out and therefore promotional efforts have no long-term benefits.
Distribution
The Company will purchase distribution and transportation services when needed. Domestic transportation costs are lower than those for international markets. Bulk-customers pay transportation.

The demand of a specific market area is supplied with production originating within that country. Market area 3 is supplied from areas 1 and 2 in relation to their production.

Delivery Priorities
The company decides the delivery priorities for both products to the three market areas.

The demand for the product is satisfied in the order of delivery specified. If there is a shortage of supply the market areas which are first in the order of delivery are supplied first. If the supply is not great enough to supply all market areas those which are later in the delivery order will have unsatisfied demand. Bulk-clients’ orders are, however, always supplied first.
There are two production areas that can be used to satisfy demand for two products in three market areas. Both production areas have two production lines, one for each product.

In the standard case both production areas are available from the beginning, but the instructor has an option to limit the production areas to one.

Production capacity is either the building or machinery capacity, depending on which is smaller. The specified production capacity can be accomplished by running 24 hours/day i.e. working in three shifts. By investing in building or machinery the company can reduce the amount of employees and decrease wage costs. Increasing capital, however, will increase capital expenditure significantly.

Personnel and raw materials are procured in relation to the production level required by the management. The cost of reducing the amount of employees is a certain percentage of annual wages.
Investments in buildings

Buildings are ready for use with a delay of one accounting period after the investment is made. The investment is, however, to be paid in full in the period when the investment decision is made.

The depreciation of a new building begins after it has been completed as opposed to when the investment is made.

Investments in machinery

Machinery is available for use in the same period as the investment is made. Make a note that the depreciation of machinery is quite high and under-utilisation of the machinery capacity is expensive.

Capacity maintenance and depreciation

The actual physical replacement investments are considered being the same as depreciation. In other words, the actual production value and book value of the buildings and machinery are reduced by the same amounts.
The level of production

The level of production is maintained at the planned level as long as machinery and building capacity are sufficient. If capacity is constrained the production of products 1 & 2 decreases equally. Note that the total production capacity is limited by either the machinery or buildings, whichever is smaller.

Production personnel

The average productivity of personnel is given by production divided by personnel. Productivity differs across products and market areas increases the productivity of personnel.

Investments in cost efficiency improvements

Investments in cost efficiency improvements are essentially training and development investments in the production personnel and processes. As a result of the investments the productivity of the production personnel increases and less personnel is required. This reduces wage costs. The effects of investments are greatest in the period when the investment is made.
Production salaries are influenced by:
1. The total amount of production personnel,
2. Salary levels and salary multipliers for the second and third working shift
3. The number of shifts (next page)

The amount of production personnel depends on the level of production and productivity for products and market areas. Part time employees are also used.

Salary levels and salary multipliers for shifts are given in the parameter list. The basic salary level is given for one-shift production. The costs of the second and third shifts are higher.
The number of shifts depends on the production capacity and the level of production decided upon by the management. Because the production capacity is achieved only through around-the-clock production, work needs to be conducted in three shifts to produce at capacity. It follows that 1/3 capacity production requires only one shift. The number of shifts varies regionally and can be calculated as follows:

Number of shifts = 3 x (level of production / production capacity)

The result can be a decimal number. E.g. 1.33 refers to two shifts being used for four months during the year or in every third production facility.
Financing decisions are typically the last set of decisions being made.

The main function of the financing decisions is to ensure that the company’s cost of borrowing is minimised. In addition, if the Shares-module is enabled by the instructors the teams can issue and buyback shares and pay dividends.

Cash at the end of the year cannot fall below 2 million in the home country’s currency. If the planned financing is not sufficient to maintain this requirement, the system will fill the gap automatically by taking short-term debt. Short-term debt is paid automatically when it isn’t needed any more.

Short-term debt includes an ‘emergency funding’ premium and it is more expensive than long-term debt. Therefore it is best to try and avoid short-term debt.

Changes in long-term loans – decision is included in the standard case. Long-term loans can be increased/decreased as needed. The company’s leverage influences the interest rate for the loans (higher leverage = higher risk = higher interest rate).
These decisions are available only if the instructor has enabled the Shares module.

**Share issues and buybacks** are made according to the market valuation in the beginning of the round. The number of shares issued or repurchased affect the issue or buyback price. Share buybacks are only possible if the company has an equivalent amount of retained earnings.

**Dividend payments** can be used to return earnings to the shareholders, assuming the company has retained its earnings.
Projections can be launched from the bottom of the page and they consist of income statement, balance sheet, and ratios.

Current round figures update continuously as decisions are made. Actualized figures for the previous round are shown on the right.
Financial Ratios I

**Gross Margin %:** \[ = \frac{\text{Gross profit}}{\text{Net sales}} \% \]

Gross margin expresses the percentage of the total sales revenue that the company retains after incurring the cost of goods sold. Cost of goods sold (COGS) includes variable costs and other costs directly linked to the sale. Gross margin % shows what percentage of sales remains to cover fixed expenses, depreciation, interest, and taxation and profit.

**Operating Profit Margin %:** \[ = \frac{\text{Operating profit}}{\text{Net sales}} \% \]

Operating profit is often also called earnings before income and taxes (EBIT). It is the income that is left, on the income statement, after all operating costs and overhead, such as selling costs and administration expenses, along with cost of goods sold, are deducted.

Operating profit margin indicates the general health of a company's core business.
Financial Ratios II

**Net Profit %:**  
\[ \text{Net Profit %} = \frac{Profit \ for \ the \ year}{Net \ sales \ %} \]

Net profit % is an indication of the overall profitability of the company as it reveals the profitability of the company after all costs of production and administration have been deducted from sales and income taxes have been recognized.

**Return on Capital Employed (ROCE)%:**  
\[ \text{ROCE} = \frac{Operating \ profit}{Average \ capital \ employed \ during \ the \ year \ %} \]

Capital employed = Equity + Interest-bearing debt

ROCE is a measure of the returns a company derives from its capital. The ratio presents how well capital is being used to generate pretax profit.

**Equity Ratio %:**  
\[ \text{Equity Ratio} = \frac{Total \ Owner's \ Equity}{Total \ Assets \ %} \]

Equity ratio measures the company’s financial solvency and indicates the relative proportion of equity used to finance a company's assets.
Cumulative Total Shareholder Return is the average annualized percentage return that a company delivers to its shareholders during the whole simulation.

It takes into account the changes in the company’s share price and cumulative dividend payments.

Example;

1. **No dividends.** Let’s say that the share price in the beginning of the game is 10EUR, and after one round (=year) the share price is 12EUR. This gives 20% return to shareholders for that given year.

2. **With dividends.** In addition to the above, the company pays a 1EUR dividend per share during the round. Total return is \((12+1)/10 = 30\%\)

In the previous we assumed that the change happened over one round. The same principle applies for multiple rounds. In that case we add cumulative dividends to the share price and annualize the return. For example, 30% cumulative return over three years would be 9% annualized return on average.
On the decision checklist page all team members’ decisions can be seen side by side. By pressing ‘copy’ a team member’s decisions are moved to the team decision column. At the deadline, the system reads the decisions from the team decision column and calculates results for the round.

Team decisions can be accessed and consequently edited directly by pressing ‘go’ in the team column.

The Import button moves another team-member’s or team’s decisions to your own column.

Also historical decisions for any team member can be accessed by choosing the respective round from the dropdown menu.
Results

After each round the system generates reports that show the results of all teams in a group.

Results consist of:

- **Summary report**: including a quick overview of the main figures.
- **Market report**: including information about sales and demand for each product and area.
- **Production report**: including information about production volumes, production personnel, and production facilities.
- **Logistics report**: including information about the inventory levels and deliveries for each production area and product.
- **Income statement; Balance sheet, Cash flow, and Ratios**: include relevant financial information that can be used to compare the financial performance of each team.

Results provide useful information about a team’s own sales, operations, and finances. In addition, results can be used to benchmark performance with the competing teams in the same market.
More Information

Cesim
Arkadiankatu 21 A
00100 Helsinki, Finland
Tel. +358 9 406 660
www.cesim.com
contact@cesim.com

Technical Support
support@cesim.com