




**CESIM GLOBAL CHALLENGE**  
Introduction

**Simulation for international business and strategy**

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### What is Cesim Global Challenge?


**Cesim Global Challenge** is an online business simulation game that develops student understanding of the complexity of global business operations in a dynamic competitive environment.

It integrates a range of concepts from various management related disciplines, including economical, political, and financial decision making, as well as accounting, procurement, HR, production, corporate social responsibility, logistics, research & innovation, and marketing.

The task for the student teams is to manage a global mobile telecommunications company through technological evolution in a fast paced 21st century operating environment. The students will develop and execute strategies for their simulated company operating in the USA, Asia, and Europe.

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### Learning Goals

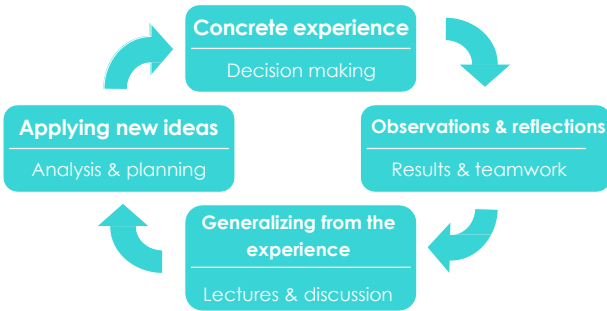
- To increase the participants awareness of the complexity of operating an international company from a strategic and general management perspective.
- To develop capabilities in identifying & analyzing key environmental and organizational variables that may influence an organization's performance within and across national markets, and how these variables may influence the organization.
- To enhance fact based analytical decision making and crystallize the financial implications of business decisions by linking the decisions to cash flows and bottom line performance.
- To give students practical experiences in teamwork and problem solving and excite competitive spirits in a dynamically evolving marketplace.

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### Learning Process



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## Web Based Solution

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.


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## 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

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## Simulation Organization

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.

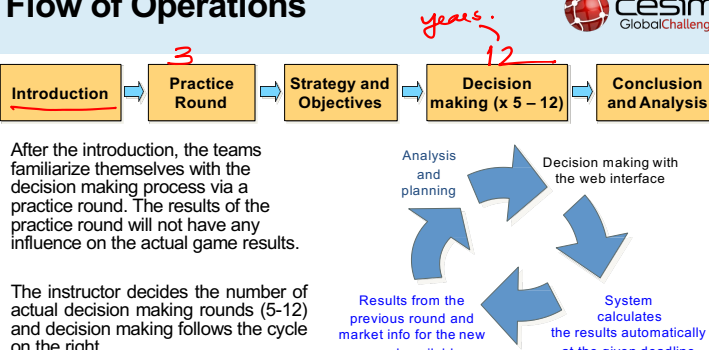
All teams are starting from exactly the same position, with similar market shares and profits. Equally, teams will face the same market conditions during the simulation.

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.

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## Flow of Operations



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.

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## Main Objective & Winning Criteria

The main objective for the teams is to deliver **sustainable, profitable growth**. Typically this is measured by a ratio called "**cumulative total return to the shareholders**", which combines share price development and dividends paid to show the total return to the shareholders.

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.

We recommend cumulative total return to shareholders due to its comprehensiveness. The teams may try to manipulate their profits, revenues, and market share in the short run, but share price will punish any short sighted decisions sooner rather than later.

*Handwritten notes:* dividend, share, Value, Debt ↓, Profit ↑, R+S, mkt sh.

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## Decision Making Fundamentals I

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 situation is cleared back to the initial, 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.**

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## Decision Making Fundamentals II

**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.

As a starting point in the simulation, the teams have only first technology products available. Further development of technologies can take place by own development or by license purchasing. Time to market with own development is one period, whereas license purchasing makes the technology available immediately.

**Remember to save the decisions before the deadline.**

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## Business Case: Mobilé Inc.

The team will take over as the new management team of **Mobilé Inc**, a global mobile handset manufacturer and will be responsible for the company's strategy, R&D, marketing, production, logistics, and finance, HR, finished goods inventories, and corporate social responsibility.

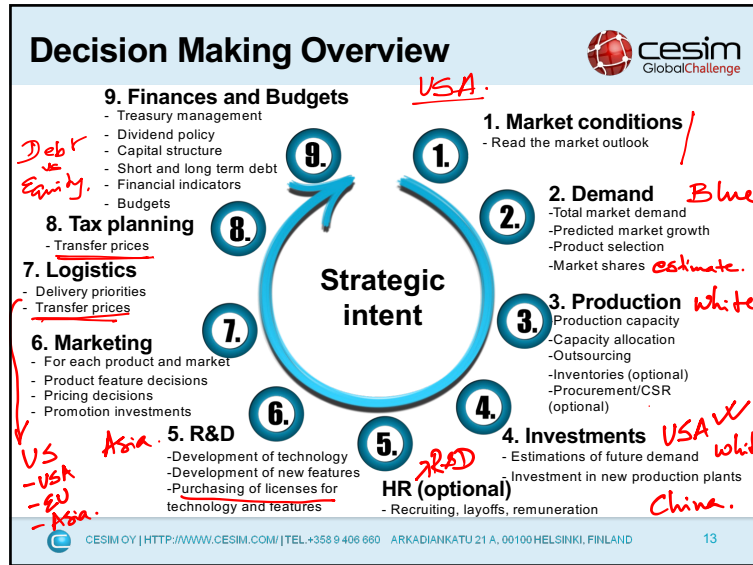
The essence of Mobilé Inc is a fast-developing mobile handset market with product life cycles driven by technological evolution.

The team will develop and execute global strategies and its success is measured by its capability to deliver value to the shareholders. Strategic approach to decision making, careful analysis, continuous R&D, good timing, and successful product positioning are the main keys to success.

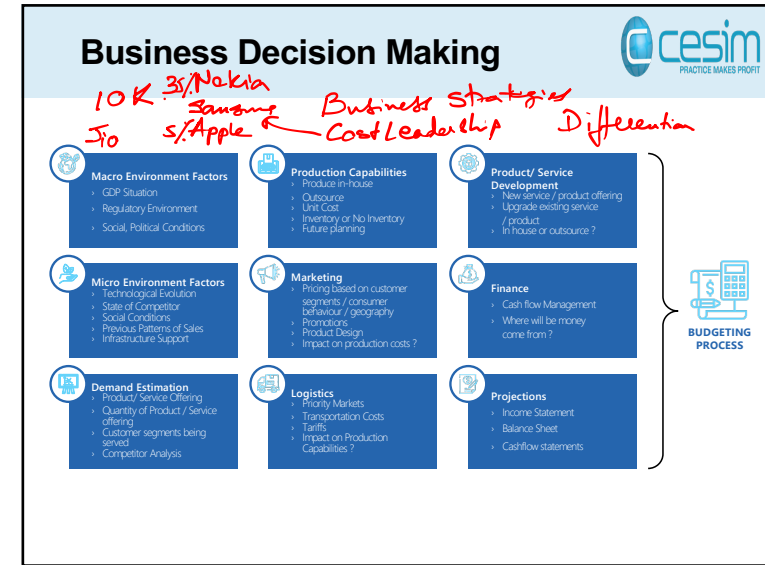
*Handwritten notes:* IG, GG.

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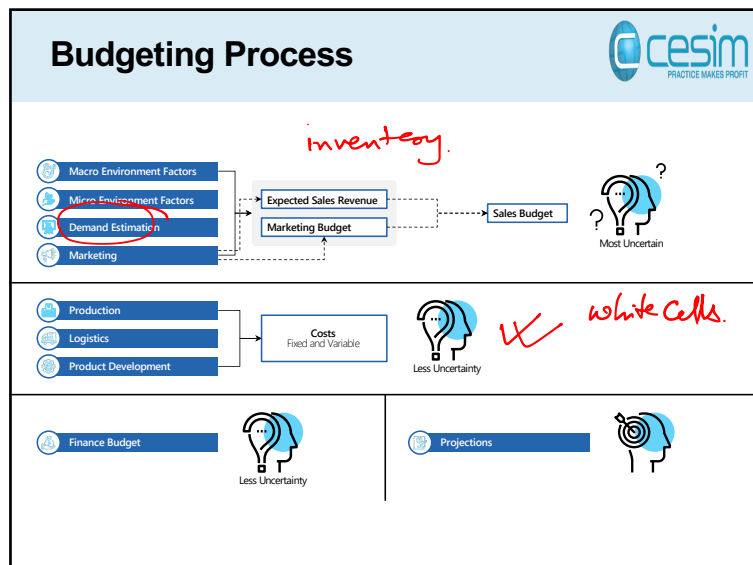
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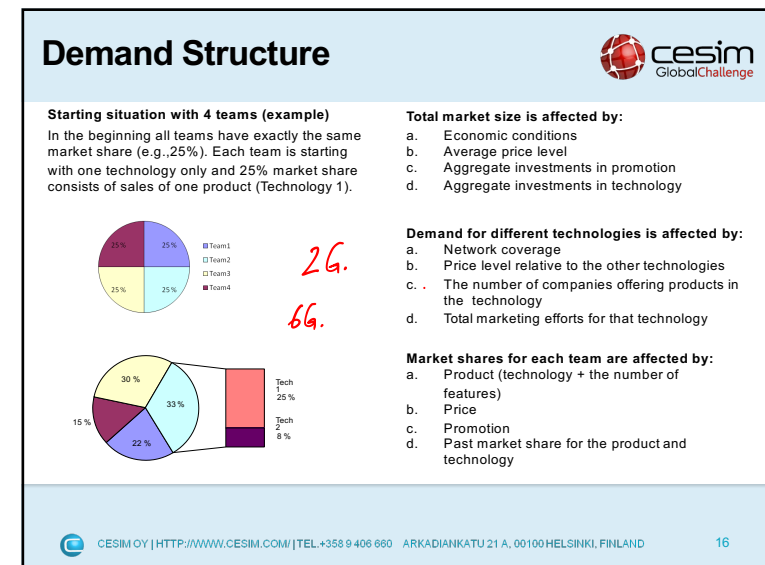
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## Demand Estimations



### Recommended steps for demand estimations:

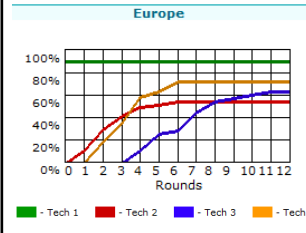
1. Estimate the total market growth for each market area. Market outlooks provide a good forecast for the expected development
2. Decide which technologies to sell in each area.
3. Estimate the market share for each product (note that the market shares are quoted per market, not per technology).

### Example of how to set market shares for two products in one market:

1. Make your best estimate about the split between the two technologies in a particular market. For example; US market Tech 1 60% and Tech 2 40%.
2. Estimate your target market share in each technology, for example; 20% for Tech1 and 35% for Tech2.
3. Calculate your share of the total market for each product:
  - Tech1:  $60\% \times 20\% = 12\%$ ,
  - Tech2:  $40\% \times 35\% = 14\%$ .
4. Input 12% and 14% in the market share cells on the demand page accordingly.

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## Network Coverage



The picture above forecasts that in round 3, Europe has 100% coverage for Tech 1, about 50% coverage for Tech 2 and 4, and coverage is just starting to develop for Tech 3.

Each market area has its own network coverage forecasts. Those forecasts are indicated in charts on "Demand" page.

### Key issues to consider:

- Network coverage forecast is not the same as demand forecast.
- Inhabitants outside the network coverage of the given technology do not purchase devices
- New technology is typically considered more attractive than old technology, ceteris paribus.
- Networks are usually established in the more condensed areas in the beginning.
- It is very costly to develop all technologies so choices must be made between them.

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## Production Decisions I



There are two production areas (USA, Asia) that can be used to satisfy demand in three market areas (USA, Asia, Europe). There are max 2 production lines per area, i.e., four in total. In the beginning, production facilities are located only in the USA.

Investments can be made to start production in Asia and/or expand production facilities in the USA. Investments take two decision-making periods from decision to completion.

Contract manufacturing can be used to complement own production. **Using contract manufacturing requires that one own production line is committed to the outsourced product.** This means that at any point during the simulation the maximum amount of different technologies that can be produced is four.

Note that contract manufacturing amounts are limited. The limits are given for each round and teams that use contract manufacturing more actively have higher limits.

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## Production Decisions II



Production is demand-driven by default, which means that there are no finished goods inventories. If the demand is overestimated, the production will be reduced automatically to match the demand. This adjustment causes additional 5-10% cost on top of the production cost. Note that **production will not adjust upwards automatically.** This means that if demand is higher than estimated, the team will encounter a situation where it can not meet the demand.

Factors that influence the production costs are:

- a. Basic cost level in the production area
- b. Production cost function (see next page)
- c. Learning curve effect (see next page)
- d. Penalty for having a too high production target as explained above

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## Inventory cesim GlobalChallenge

If your Global Challenge course has inventories enabled, you will find detailed information on the inventory page under the production tab. The beginning and ending inventory figures are also presented on the production planning page.

USA and Asia production facilities have their own inventories and products are never shipped between the areas unless there is market demand.

All products in inventory are carried at their original production cost and there is no depreciation of inventory. Inventories incur management costs that are reported as part of the administration costs in the P&L and also separately on the production report.

Inventory value is calculated based on first in – first out (FIFO) method.

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## Production Cost Function & Learning Curve cesim GlobalChallenge

**Production cost function:**

- Presents production costs per unit as a function of the capacity utilization.
- Production cost minimum can be found in the range of 75-85% capacity utilization
- NOTE: Minimization of costs does not always lead to profit maximization

**Learning curve:**

- Presents production costs per unit as a function of cumulative production per technology, i.e., the more you produce of each technology, the cheaper the production per unit
- Steepness of the curve is different between USA and Asia.

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## Procurement/CSR cesim GlobalChallenge

If your Global Challenge course has corporate social responsibility module enabled, you will find procurement page under the production tab.

On the procurement page you can choose between five different component suppliers. The suppliers have different ratings for their sustainability and ethics. In addition, they have different costs for the components. When you choose suppliers that have higher ratings you improve your company's image and it will give you additional benefit in your marketing efforts.

There is always a fixed cost for changing a supplier and to prevent your company from switching from one supplier to another too frequently you can purchase studies from independent evaluators in order to determine the potential long-term development of the suppliers.

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## Human Resources I cesim GlobalChallenge

Global Challenge can be used with or without human resources decisions. If your course has them enabled, you are able to hire R&D personnel to handle the research and development function in addition to buying technology and design licenses. This will alter the in-house development detailed in the next section.

The human resources function consists of three decisions: number of employees this round, monthly salary and monthly training budget. The number of employees is definite and you can always have the amount of workforce you wish provided that your salary level is high enough. You can also lay off all employees if you so choose. Costs from human resources include salary, training, recruitment, layoff and other R&D costs. All of these items are included in research and development costs on the income statement.

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## Human Resources II



Key issues to consider in human resources include **employee turnover** and **efficiency**.

Employee turnover is influenced by:

- a) Salary
- b) Training
- c) Success of the company
- d) Good use of employees' time (no redundancy)

Employee efficiency is influenced by:

- a) Salary through ability to attract talent
- b) Cumulative training expenditures
- c) Low employee turnover

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## Research & Development



Research and development consists of own research & development and license purchases. The main differences between the two are time-to-market and costs. Own R&D has one period delay before the technologies and features become available for production. License purchases bring technologies and features available immediately.

Payment for the license is a one-time fee that gives the rights for the technology and features indefinitely.

Teams can use any combination of the two to reach the desired level of technologies and handset features. For example, team can first invest into its own R&D, then decide to speed up the process and buy a technology license, and then return back to own R&D. The only requirement is that you have completed the particular R&D cycle (new technology or new product feature) before you switch between in-house and licensing.

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## Research & Development with HR



If your course has human resources decisions enabled, the in-house development deals with man-days instead of cash. The development will work the same way as with cash, but in this case you have to synchronize your product development decisions with your human resources decisions.

It also means that the required development effort varies based on your efficiency level and the ultimate costs of development also depend on your salary and other HR decisions.

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## Marketing



In the simulation the marketing mix consists of product (technology and features), price, promotion (product promotion and brand).

Customers are comparing between the offers of the different vendors and making their purchase decisions accordingly. This means that each teams' marketing mix relative to the other teams' marketing mixes is crucial in the process of dividing market shares between the teams.

It is notable that the **demand function is continuous**, without discrete steps. This means that the demand does not explode or collapse at any particular single point, e.g., price above/below certain level, but it reflects the consumers preferences on a continuous scale.

The actual marketing decisions include product features, pricing, and promotion. Each of these decisions are made for all products in all markets.

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## Marketing – Features, Price, Promotion



**Features** can only be implemented if the company has invested sufficiently to its own R&D or license purchases. Team can decide to implement between 1 and 10 features to its devices. From the consumers' point of view more features is better than less features (in the given scale of 1-10). Implementation of product features causes additional costs.

**Price** is the single biggest factor that influences demand and demand's elasticity to price is always negative. Price elasticity differs between the markets.

**Promotion** decision influences the demand at three levels: product, market, and global. Only the product promotion decision is made explicitly, but the total of the product promotions in one area are summed up as market promotion, and the total of all product promotions in all areas are summed up as global promotion.

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## Logistics



As the production is demand driven, the logistics is demand driven too. This means that the products are shipped from the manufacturing sites automatically to the sales sites according to the production capacity allocations. No separate decision is needed for the shipping.

A key driver for logistics is that each manufacturing site is incentivised to minimise the idle time in production. Consequently, if a team overestimates demand, the excess will be reduced from both production areas even if it would be cheaper to ship everything from one area and stop the machines in the other area.

In practice this means that in order to minimize the logistics costs, a team should allocate exactly the right capacity in the right places at the right time. This can only be achieved by managing the whole demand-supply network well.

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## Logistics – Delivery Priorities



Teams can choose in which order they satisfy the demand for different technologies in the markets. For example, delivery order 1,3,2 would mean that first the whole demand is satisfied in the USA, secondly in Europe, and third in Asia. Delivery priorities are set for both production areas and each technology separately.

Delivery priority decision is very relevant if the team's global supply is not enough to satisfy the global demand. For example, delivery order 1,3,2 means that if the team runs out of supply, deliveries will first be cut from Asia.

In order to maximize profits, teams must be aware of the profitability for each product and market and set the priorities accordingly.

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## Tax



Tax page gives you information about your company's taxes in each area as well as about the global effective tax rate. Please note that loss-carry-forward is taken into account.

Transfer pricing can be used to allocate R&D and other fixed costs between the countries and to benefit from different tax rates. In practice this means adjusting profits between different areas.

Transfer price is set as a multiplier. The multiplier determines how much the manufacturing unit is adding margin on top of the direct variable cost when it ships the products to the sales unit.

Transfer pricing is a highly regulated discipline in the real life and it is regulated also in the simulation game. The multipliers must be between 1 and 2, which means that the internal price between the manufacturing unit and sales unit can not exceed two times the direct variable cost in any situation.

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## Financing I



Financing decisions are typically the last set of decisions being made.

The goal of the financing decisions is to **minimize the cost of funding** to the company and to **return capital** to the equity holders. Decisions that are available include:

- treasury management (transferring funds between group companies)
- increases (+) and decreases (-) in long-term loans
- share issues and buy-backs
- dividend payments

Cash at the end of the year cannot fall below 2 million USD. 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 in this case includes 'emergency funding' premium and it is more expensive than long-term debt. Therefore it is best to try and avoid short-term debt.

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## Financing II



The **treasury management** decision can be used to transfer funds between different countries by internal loans, for example to repatriate excess cash resources from Asia and/or Europe or to supply funding for plant investments in Asia.

**Long-term** loans can be increased/decreased as needed. The company's leverage influences the interest rate for loans (higher leverage = higher risk = higher interest rate).

**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 equivalent amount of retained earnings.

**Dividend payments** can be used to return earnings to the shareholders, assuming the company has retained its earnings.

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## Projections



Projections can be launched from the bottom of the page and they consist of profit and loss statements and balance sheets for the whole group and each area separately. In addition, projections include key financial ratios and parameters.

IS GLOBAL IS USA IS ASIA IS EUROPE BS GLOBAL BS USA BS ASIA BS EUROPE RATIOS PARAMETERS

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

Note that all R&D and marketing (promotion) costs are expensed on the profit and loss statement during the period the investments are made. As a consequence, profit for the year may heavily fluctuate depending on the intensiveness of R&D and marketing investments.

R&D expense is split between USA and Asia relative to the number of production facilities. That is, if there are production facilities only in the USA, all R&D expenditure will be expensed in the USA.

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## Key Financial Indicators I



### Operating profit before interest, taxes, depreciation (EBITDA) % = EBITDA / Sales

Gives indication about the company's current cash generation capability. It is calculated as sales revenue minus operating expenses, excluding depreciation.

### Operating profit before interest and taxes (EBIT) % = EBIT / Sales

Gives indication about the profitability that the company is earning from its operations. Calculated as sales revenue minus all operating expenses, including depreciation.

### Return on sales (ROS) % = Profit for the year / Sales

How much the company earns from every dollar in sales. Also referred to as profit margin.

### Equity ratio = Shareholder's equity / Total assets

Indicates the company's financial leverage, i.e., what proportion of assets are financed with equity.

**Gearing, % = (Long term loans + Short term loans – Cash and cash equivalents) / Total equity**  
Net debt to equity (gearing) is a ratio of a company's level of long-term debt in comparison to its equity capital. Gearing, like equity ratio, indicates financial leverage, but gearing takes the company's cash position into account.

### Return on capital employed, ROCE % = EBIT / (Total assets – Current liabilities)

Indicates the efficiency and profitability of a company's capital investments. Here, **EBIT** (Earnings before Interest and Taxes) equals turnover minus costs and expenses during year, whereas current liabilities are comprised of short term debts and payables that are due within a year.

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## Key Financial Indicators II

**Return on equity, ROE % = Profit for the year / Average shareholders' equity**  
Indicates the return that the company earns to its shareholders

**EPS (Earnings per share), € = Profit / Number of shares outstanding**

**Dividend yield-% = Dividend per share / Share price**  
Indicates the annual percentage of return that the current level of dividend provides to the investor, as compared to the current share price

**P/E = Market value per share / EPS**  
P/E indicates how many years it takes with the current level of earnings to pay the price of one share.

**Cumulative total shareholder return, % (winning criteria)**

$$100\% \times \left[ \left( \frac{\text{current share price} + \text{cumulative dividends per share}}{\text{initial period share price}} \right)^{(\text{if the period})} - 1 \right]$$

The concept of total shareholder return is explained on the next slide

Capex  
→ Debt  
→ Equity

2mn.  
OpEx  
→ Short term loan  
→ Redeemed & supplied

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## Cumulative Total Shareholder Return

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:

- 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.
- 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.

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## Decision Checklist

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.

Practice round 1

TEAMS DECISIONS

GERALD WHITE

MURIEL BAILEY

TERESA NGUYEN

Go to decision area:

GO

GO

GO

Save as team's decisions

COPY

COPY

COPY

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

Note that previous round decisions will be used if there are no saved decisions for the round.

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

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## Do not Forget – At each Period

To read market outlook.

To analyze the parameters.


To analyze the results.

To save the decisions.

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## Results




After each round the system generates reports that show the results of each team within one simulation universe.

Results consist of:


- Summary report** with a set of charts
- Financial statements**; including consolidated P&L and balance sheet, and parent company (USA) cash flow statement
- Financial ratios**; including share price info and key financial indicators
- Area reports** for all areas; including market reports and P&L and balance sheet for each business area
- Production report**; including information about the production volumes, contract manufacturing, production facilities
- Cost report**; including information about scrap rates and production and logistics costs
- HR report** and **Social responsibility** report are optional and visible only if the modules are activated.

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.

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