
# Game Introduction

Case “BioCounter Ltd”

2010

**Welcome to RealGame training and to the Management Team of BioCounter Ltd!**

Welcome to the RealGame simulation game training. We are looking forward to an opportunity to learn by doing in a nice and efficient way. RealGame training is especially powerful in illustrating the dynamics and the holistic structure of a business organization – issues that many of us encounter in our work, but which are difficult to illustrate by traditional business training.

With this game introduction and pre-assignment you can make yourself familiar with the basics of RealGame simulation and your game company. **Acquaint yourself with this introduction and answer the questions in the end of this manual.** The assignments require simple calculations which will help you to understand the basic relationships in the simulation supply chain. We will go through the assignments when we meet and you should be prepared to argue for your calculation answers when we meet.

During the game it is recommended that each team has a calculator. Bring also with you good sportmanship, team spirit and will to succeed!

## BioCounter Ltd

You have been chosen to steer BioCounter Ltd. Your decisions on purchasing, manufacturing, sales, marketing, product development, finance and strategy will determine the success or failure of BioCounter Ltd. Your competitors will try to maximize their profits as well.

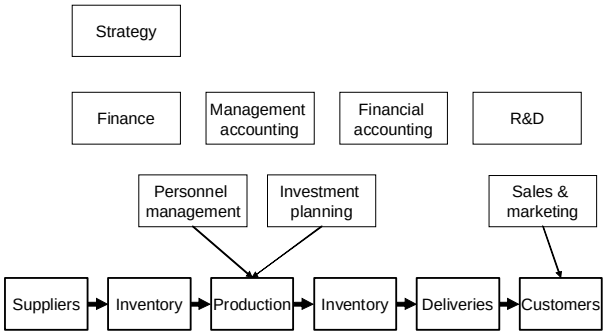



**Figure**: The business functions in BioCounter Ltd

BioCounter Ltd is a domestic company manufacturing manufacturing high tech laboratory equipment for the Nordic, European and the American markets. BioCounter Ltd was established in 1978 as the repair shop for laboratory equipment. During the 1990s the company experienced a dramatic change in it's operations and started developing new analytical laboratory equipment. **BioCounter™** was the first commercially viable product developed and the repair shop's big break. The company experienced huge demand for its revolutionary new analytical equipment and turnover sky-rocketed. As a result of this success, the company developed a new improved version of this analytical equipment called **BioCounter DLX™**.

During the autumn of 2009, due to severe competition which eroded profitability significantly, the company decided to seek ways to recreate the growth curve from the previous decade, to increase efficiency and thus increase profitability and therefore shareholder value. At the moment BioCounter Ltd has some 4-6 competitors. During the past years the growth of the company has led to uncontrolled investments and unbalanced capacity. It is now apparent to management that a new look has to be taken at the sourcing and the inventory management. Thus, there is a need to balance the internal processes in order to succeed in the primary task – increasing profitability.

Your team has been brought in to achieve this goal!

**Figure**: BioCounter DLX

## The simulation environment

RealGame simulation is continuously operated. It means that the operations in the simulation company are triggered hour by hour, in one hour steps. The simulation runs 24 hours per day. There are 7 days a week and all the week days are equal regarding, for example, the market demand. There are 28-31 days per month, as in the real world calendar. If you need to, you can run your company's production in three shifts (night, morning, evening; each 8 hours long).

### BioCounter product portfolio

The production and distribution functions of BioCounter Ltd are situated in Northen Europe. The company currently has two end products **BioCounter™** and **BioCounter DLX™**. Your Research and Development department are working on a newer improved model **BioCounter XL**. It seems that customers are eagerly waiting for this new development.

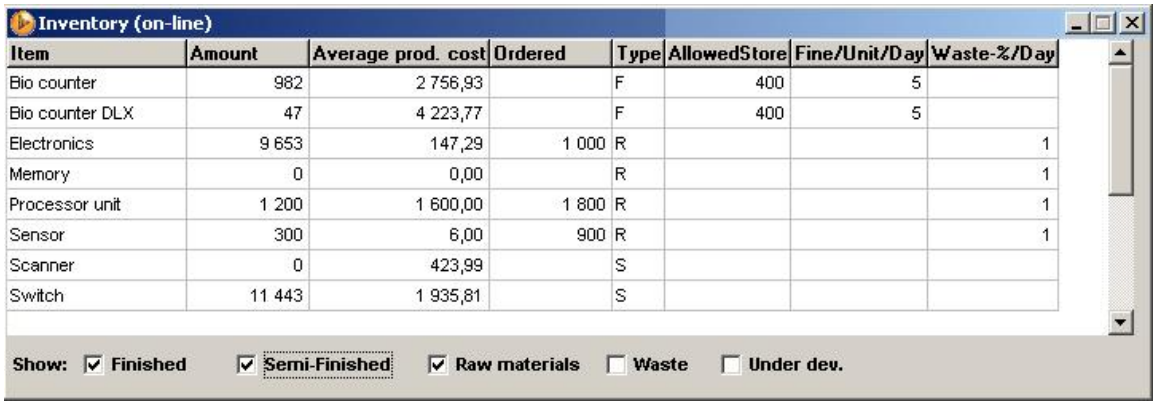
### Raw Material Purchases

Your production line requires frequent raw material purchases. You have several suppliers for each of the raw materials. These different suppliers have different prices, delivery times and terms of payment. When you place a raw material order to a supplier, the supplier will automatically send the ordered raw material. The table below shows the raw material suppliers with different raw material delivery terms:

| Supplier | Raw material | Price | Delivery time (h) | Term of payment (d) |
|---|---|---|---|---|
| NY Electrobits Ltd. | Sensor | 6,00 | 168 | 7 |
| Freezer Electronics | Sensor | 11,00 | 72 | 30 |
| Electronics Ltd. | Sensor | 22,00 | 18 | 14 |
| Freezer Electronics | Electronics | 48,00 | 96 | 4 |
| Electronics Ltd. | Electronics | 75,00 | 48 | 30 |
| NY Electrobits Ltd. | Electronics | 98,00 | 10 | 14 |
| Electronics Ltd. | Processor unit | 1 550,00 | 168 | 7 |
| Y2K ComplianceLtd | Processor unit | 1 700,00 | 72 | 30 |
| Y3K ComplianceLtd | Processor unit | 1 850,00 | 24 | 14 |

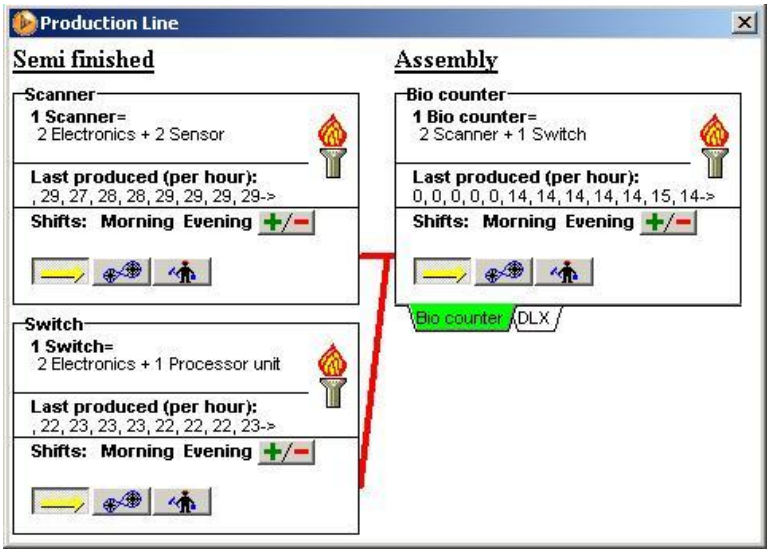
## Inventory

The raw materials purchased from a raw material supplier will be placed in the inventory. The inventory is an on-line inventory (inventory values are updated in real-time). The inventory value should be as low as possible to ensure that scarce capital is not unncecessarily tied up in materials (the example below is not a particularly good example of effective inventory management – see the huge Bio counter, Electronics and Switch inventories).




## Production

The manufacturing consists of three production cells. Production decisions include: selecting during which shifts the cells will be working (morning, evening, night), investing in machine capacity, and hiring workers.

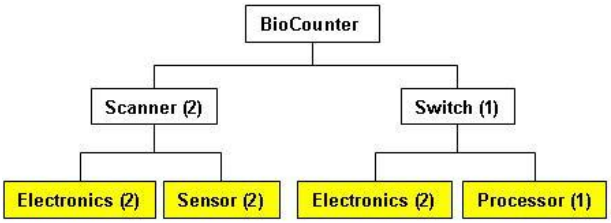



An important part of the production process is to change the assembly phase production between Bio counter and Bio counter DLX (same machinery is used for both products, but **only one can be produced at a time**). To change the end product in the Assembly (from Bio counter to Bio counter DLX and the other way around) requires a 4 hour set up run, during which no products are produced. Set up can be run only when the workers are at work.

The finished goods from production will be placed in the inventory where from they are to be delivered to the customers.

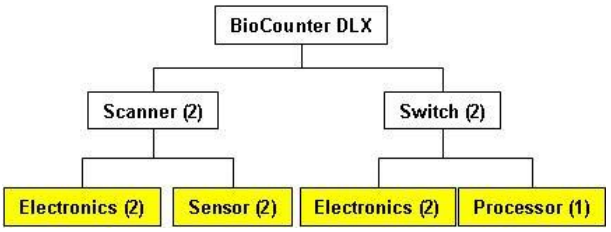
The bill of materials (BoM) of Bio counter is shown on the right. To produce 1 Bio counter requires 2 Scanners + 1 Switch. In the sub-assembly, to produce 1 Scanner requires 2 Electronics + 2 Sensors, and so on. Alltogether, to produce **one Bio counter** requires the following raw materials:

- 6 Electronics
- 4 Sensors
- 1 Processor unit




On the right, the BoM for Bio counter DLX. Note the second Switch in structure. Alltogether, to produce **one Bio counter DLX** requires the following raw materials:

- 8 Electronics
- 4 Sensors
- 2 Processor units



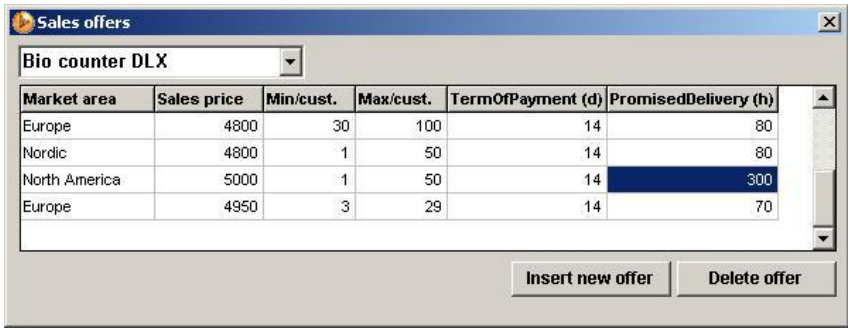

The production cell capacities are the following:

| Production Cell | Capasity per hour | Capasity per shift | Capasity per day | Price for a new machine | Machine capasity |
|---|---|---|---|---|---|
| **Scanner** | 32 units | 256 units | 768 units | 150.000 € | 4 units |
| **Switch** | 24 units | 192 units | 576 units | 150.000 € | 6 units |
| **BioCounters** | 20 units | 160 units | 480 units | 300.000 € | 5 units |

Capasity per day can be achieved by using all the three shifts. The above capasity values are theoretical and they are very seldom achieved. Note, that the production shift extra salaries are very high when using evening and night shifts. The production costs of producing a BioCounterissa is approximately 2.700 €/unit and 4.700 €/BioCounter DLX. After the variable production costs you also need to pay fixed costs which are roughly from 30% to 40% of the amount of production costs.

## Offers

The customers make purchase decisions based on your offers. The figure below shows the terms in sales offers. Note, that you can create several offers for one market area. In the example below the company is willing to sell smaller lots (3-29 units) to the European market if the customer agrees to pay 150 euros extra. The customers are also promised a slightly faster delivery when they order a small lot in the European market. You can also try to make the customers pay faster by promising a faster delivery, or any other combination available through changing the sales terms.



Besides of the offer terms also the quality of our products, the money invested in advertising and our historical delivery certainty affect the sales.

### Incoming Orders and Delivering

If a customer values our offering to be good enough, it will send us an order. You as the decision-maker need to deliver the incoming orders. In deliveries you have the following delivery methods available.

| Market area | Delivery method | Duration (h) | Fixed cost | Cost/unit |
|---|---|---|---|---|
| Nordic | Truck | 72 | 100 | 10 |
| Nordic | Air freight | 48 | 50 | 50 |
| Nordic | Courier Service | 24 | 100 | 60 |
| Europe | Truck | 72 | 100 | 50 |
| Europe | Air freight | 48 | 50 | 250 |
| Europe | Courier Service | 24 | 100 | 300 |
| North America | Shipping | 288 | 100 | 50 |
| North America | Air freight | 120 | 50 | 300 |
| North America | Courier Service | 48 | 100 | 350 |

Note, that faster deliveries are more expensive than slower ones. This has to be taken into account when planning customer offers: a sales offer with a fast promised delivery should have a higher sales price than an offer with a slower promised delivery, if you want to make same profit with the different sales offers.

## Competitive Factors

The markets and how the customers in each of them react to different terms and investments you can use as competitive factors are shown in the table below (the more bullets, the more important the factor is for the demand of your products).

| Market | Market volume per month, BioCounter | Market volume per month, BioCounter DLX | Timely deliveries Rapid effect on sales | Price Rapid effect | Advertising Mid-long delay in effect | Term of payment Rapid effect | Delivery speed Rapid effect | Quality Long delay in effect |
|---|---|---|---|---|---|---|---|---|
| **Nordic** | ~10.000 | ~5.000 | ●●●● | ●● - ●●●●● | ●●● | ●●● | ●● - ●●●● | ●●●● |
| **Europe** | ~15.000 | ~10.000 | ●●●●● | ●●● | ●● | ●●● | ●●● | ●●●●● |
| **North-America** | ~6.000 | ~5.000 | ●●●●● | ●● | ●● | ●●● | ●● - ●●● | ●●●●● |

The market volume in the table is configured for 6-8 participating companies. Your share of the market volume in the beginning of the game will be approximately 1/6 – 1/8 of the total sales volume in the table.

BioCounter is a downward product in that sense that its technology is somewhat outdated and its demand is already decreasing. BioCounter DLX, however, is still a strong product in the market.

During the game you also have a possibility to develop a new product. The market volume for that new product (BioCounter XL) will probably be similar to that of DLX's. But there are some signs that XL will become much more important in the future. The R&D department's estimates for the cost of developing a marketable XL product are around 7-10 % of the company's turnover. But this requires steady investment on the product development process.

Typical for the supply market is strong decrease in the prices of semiconductors.

## Based on the information given on previous pages, answer to the following questions.

1. Which are the factors that affect your success in RealGame simulation?

2. What do you expect to learn during the simulation training? List at least three topics in the order of importance (1 = the most important).

3. The total market volume is 31.000 Bio counters and 20.000 Bio counter DLXs per month and there are 8 competing companies. What is the share of sales you should aim at? So, how many BioCounters and BioCounter DLXs can you expect to sell per month?

4. Based on the previous calculations, how much raw materials are required per day to answer to the demand you calculated above?

   - Electronics?
   - Sensors?
   - Prosessor units?

5. Suppose that you order each raw material from the cheapest suppliers. How much of each raw material you need to have in the inventory when you place the order, in order the raw material inventory to last for production during the raw material delivery? See the supplier table on page 3.

   - Electronics?
   - Sensors?
   - Prosessor units?

# APPENDIX

## RAW MATERIAL SUPPLIERS

| Supplier | Raw material | Price | Delivery time (h) | Term of payment (d) |
|---|---|---|---|---|
| NY Electrobits Ltd. | Sensor | 6,00 | 168 | 7 |
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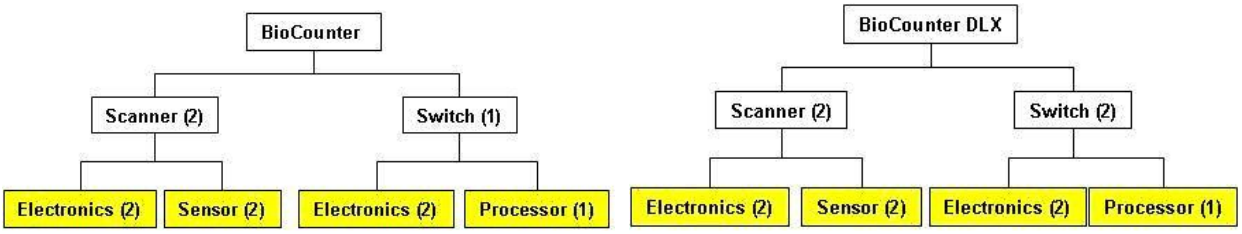
## PRODUCT HIERARCHIES




## OUR OWN INVENTORY IN THE BEGINNING

| Item | Type | Inventory (units) | Waste-% / day |
|---|---|---|---|
| Sensor | Raw material | 4.000 | 1,0 % |
| Electronics | Raw material | 5.000 | 1,0 % |
| Processor unit | Raw material | 1.000 | 0,5 % |
| Scanner | Semi-finished | 800 | 1,0 % |
| Switch | Semi-finished | 800 | |
| BioCounter | Finished product | 150 | |
| BioCounter DLX | Finished product | 150 | |

## COMPETITIVE FACTORS

| Market | Market volume per month, BioCounter | Market volume per month, BioCounter DLX | Timely deliveries Rapid effect on sales | Price Rapid effect | Advertising Mid-long delay in effect | Term of payment Rapid effect | Delivery speed Rapid effect | Quality Long delay in effect |
|---|---|---|---|---|---|---|---|---|
| **Nordic** | ~10.000 | ~5.000 | ●●●● | ●● - ●●●●● | ●●● | ●●● | ●● - ●●●● | ●●●● |
| **Europe** | ~15.000 | ~10.000 | ●●●●● | ●●● | ●● | ●●● | ●●● | ●●●●● |
| **North-America** | ~6.000 | ~5.000 | ●●●●● | ●● | ●● | ●●● | ●● - ●●● | ●●●●● |

## TERMS OF DELIVERY

| Market area | Delivery method | Duration (h) | Fixed cost | Cost/unit |
|---|---|---|---|---|
| Nordic | Truck | 72 | 100 | 10 |
| Nordic | Air freight | 48 | 50 | 50 |
| Nordic | Courier Service | 24 | 100 | 60 |
| Europe | Truck | 72 | 100 | 50 |
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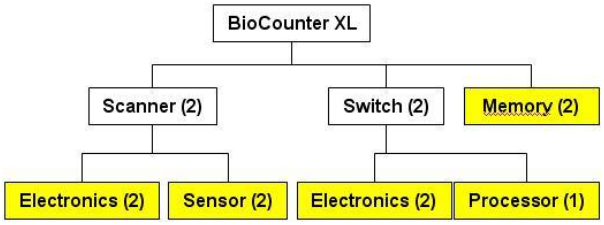
| Europe | Courier Service | 24 | 100 | 300 |
| North America | Shipping | 288 | 100 | 50 |
| North America | Air freight | 120 | 50 | 300 |
| North America | Courier Service | 48 | 100 | 350 |

## SALES OFFERS IN THE BEGINNING OF THE SIMULATION

| Product | Market area | Sales price | Min | Max | Term of payment (d) | Promised delivery time (h) |
|---|---|---|---|---|---|---|
| Bio counter | Nordic | 3.800 | 1 | 50 | 14 | 80 |
| Bio counter | Nordic | 3.700 | 21 | 100 | 12 | 90 |
| Bio counter | Europe | 3.800 | 1 | 50 | 14 | 80 |
| Bio counter | Europe | 3.700 | 21 | 100 | 12 | 90 |
| Bio counter | North America | 4.000 | 1 | 50 | 14 | 300 |
| Bio counter | North America | 3.900 | 21 | 100 | 12 | 320 |
| Bio counter DLX | Nordic | 6.700 | 1 | 50 | 14 | 80 |
| Bio counter DLX | Nordic | 6.600 | 21 | 100 | 12 | 90 |
| Bio counter DLX | Europe | 6.700 | 1 | 50 | 14 | 80 |
| Bio counter DLX | Europe | 6.600 | 21 | 100 | 12 | 90 |
| Bio counter DLX | North America | 6.900 | 1 | 50 | 14 | 300 |
| Bio counter DLX | North America | 6.800 | 21 | 100 | 12 | 320 |

## BoM OF Bio counter XL

Bio counter XL is a product you can start producing and sell after a certain R&D process. In the beginning of the simulation, you do not have Bio counter XL in your product portfolio. When the R&D process is finished, the XL product appears as a third production alternative in the Assembly phase of the production process.




## OTHER INFORMATION

| | |
|---|---|
| New machinery in use (days after the order) | 7 days |
| | |
| Production worker recruiting delay | 4 days |
| Production worker sacking delay | 7 days |
| Probability for a worker resignation | 2% / month |
| Production worker salary | 60 €/h |
| Extra salary cost during evening shift | 25 € / worker / h |
| Extra salary cost during night shift | 50 € / worker / h |
| | |
| Cash in the beginning | 250.000 € |
| Interest for negative cash | 5% / month |
| Interest for a bank loan | 6% / year |
| Fixed administrative costs / month | 300.000 € |
| Administrative costs / production machine | 20.000 € |
| | |
| Raw material ordering cost (per order) | 700 € |
| Cost of cancelling a customer order | 10 % |