



Introduction

Case BioCounter Ltd

Turku School of Economics, Finland
Timo Lainema & Eeli Saarinen
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Welcome to VIBu training and to the Management Team of BioCounter Ltd!

Welcome to the VIBu simulation game training. We are looking forward to an opportunity to learn by doing in a nice and efficient way. VIBu 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.

The VIBu model applied now is a sub-producer business logic model, with two kinds of human operated companies: Sub-Producers and BioCounter producers. Sub-Producers will provide BioCounter producers with certain raw materials without which the BioCounter producers cannot run their production process. **You will be a member in a BioCounter producer company.**

With this game introduction and the video presentations at

<http://www.realgame.fi/video/start.htm>

you can make yourself familiar with the basics of VIBu/RealGame simulation and your game company. **Acquaint yourself with the introduction materials. You can also sketch out the challenges in your materials process by thinking of the questions in the end of this manual.**

Bring with you good sportmanship, team spirit and will to succeed!

BioCounter Ltd

Congratulations! You have been appointed to the Top Management Team (TMT) of BioCounter Ltd. You are welcome to join an innovative, dynamic and successful company, where you, together with your colleagues, are responsible for the strategic management and operations management in the company.

The strategic management of the company consists of analyzing the external environment and analyzing the internal processes of the company. You will utilize your analyses, calculations and decisions regarding purchasing, manufacturing, sales, marketing, product development and finance to steer the company, and ultimately to determine the success or failure of BioCounter Ltd. Your competitors will try to maximize their profits as well.

In the following illustration you will see how the business functions in BioCounter Ltd are organized.

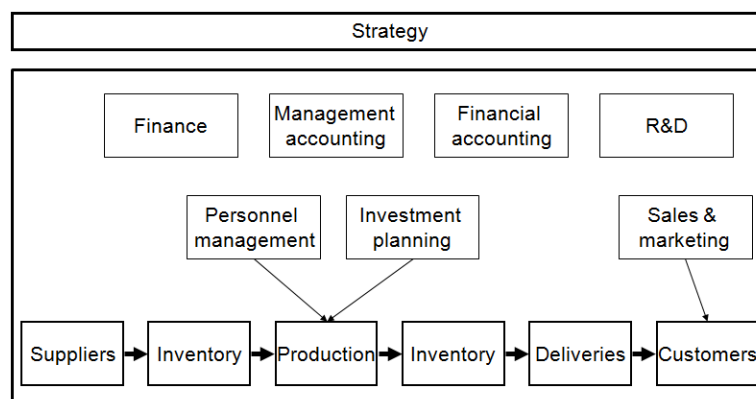


Figure 1: The business functions in BioCounter Ltd

BioCounter Ltd is a company 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 1990's 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 commercial break. The company experienced huge demand for its revolutionary new analytical equipment and its turnover sky-rocketed. As a result of this success, the company developed a new improved version of this analytical equipment called **BioCounter DLX™**.

Starting from autumn 2012 the tightening competition eroded profitability significantly. The company decided to seek ways to recreate the growth curve from the previous decade in order to increase efficiency and this way, also to increase profitability and shareholder value. There are around 9 major competitors in the analytical instruments market. 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 at 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!

Work in BioCounter Ltd is based on an engineer-driven, innovative culture. This culture spreads from product development to sales, marketing and any other function of the company. The people at BioCounter Ltd are proud of their technological innovations and state-of-the-art products.

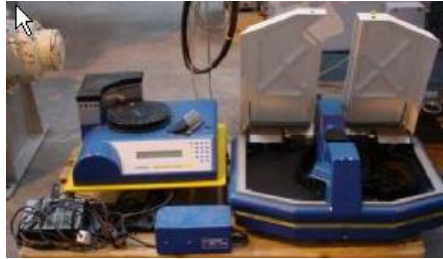


Figure 2: BioCounter DLX

Competitive situation

The market is currently very competitive, and it has been difficult for any company to gain market shares. There are around 9 companies (companies 6-14) manufacturing and selling different BioCounters and 5 companies (companies 1-5) selling different components to BioCounters at the moment.

The demand for BioCounters has been decreasing slowly during the past couple of years, but the demand for BioCounter DLX's has been increasing in all market areas. BioCounter is a downward product in that sense that its technology is somewhat outdated. BioCounter DLX is gradually gaining market share from BioCounter. However, BioCounter is still a strong product in all markets, and its sales volumes are still higher than those of BioCounter DLX.

The markets are also eagerly waiting for new product innovations and launches. It is possible that with a special kind of a new biocounter product it is possible to gain a profitable share of the current market. The code name for the new product is BioCounter XL, and it is expected to have the capacity of handling more bio-samples in one analysis process. All companies on the market are basically capable of starting new product development process for BioCounter XL, but it seems that none of them have done this so far. Typically, the development of a new product innovation in this industry has taken several years. However, this time it has been estimated that as BioCounter XL is based on the existing technologies, a new product could be developed radically faster. A product development time of only a few weeks can be met, if the development investment only is high enough. The R&D department's estimates for the cost of developing a marketable XL product are around 7-10 % of the company's turnover during the development period.

The simulation environment

VIBu 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 Northern Europe. The company currently has two end products **BioCounter™** and **BioCounter DLX™**. Your Research and Development department are ready to start 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 Sensor raw material suppliers with different delivery terms:

Supplier	Raw material	Price	Delivery time (h)	Term of payment (d)
NY Electrobites Ltd.	Sensor	6,00	168	7
Freezer Electronics	Sensor	11,00	72	30
Electronics Ltd.	Sensor	22,00	18	14

Sensors are bought from the world market (the table above indicating these suppliers). The world market suppliers can only be contacted on-line.

You also need to purchase Electronics and Processor units from local suppliers. You are able to negotiate with these suppliers, e.g. by Skype or chat. Thus, some of the simulation session participants will run these suppliers (Sub-Producers, companies 1-5) and you will negotiate over the terms personally with the Sub-Producer management.

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 unnecessarily tied up in materials (the example on the next page is not a particularly good example of effective inventory management – see the huge Bio counter, Electronics and Switch inventories).

Type F items in the inventory are finished goods, type R are raw materials, and type S are semi-finished products. Note that there are some deliveries which will arrive in the near future (for example 1.000 units of Electronics are on their way towards the inventory).

An important inventory management issue is to avoid waste. The Waste-%/Day column tells you that every 24 hours 1 % of the raw materials will get spoiled (0,5% for Processor units). This means that you need to avoid high raw material inventories in order not to get waste from the raw material inventory.

Item	Amount	Average prod. cost	Ordered	Type	AllowedStore	Fine/Unit/Day	Waste-%/Day
Bio counter	982	2 756,93		F	400		5
Bio counter DLX	47	4 223,77		F	400		5
Electronics	9 653	147,29	1 000	R			1
Memory	0	0,00		R			1
Processor unit	1 200	1 600,00	1 800	R			0,5
Sensor	300	6,00	900	R			1
Scanner	0	423,99		S			
Switch	11 443	1 935,81		S			

Show: Finished **Semi-Finished** Raw materials Waste Under dev.

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.

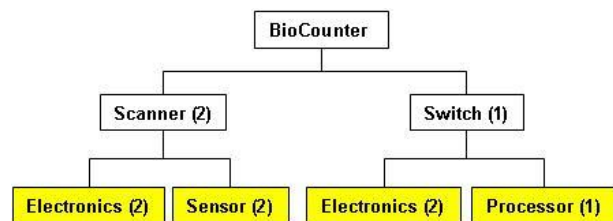
An important part of the production process is to change the assembly phase production between Bio counter and Bio counter DLX (same machinery is used for both products, but **only one can be produced at a time**).

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.

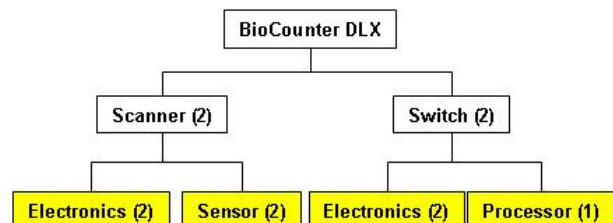
The bill of materials (BoM) of Bio counter is shown on the right. To produce 1 Bio counter requires 2 Scanners + 1 Switch. In the sub-assembly, to produce 1 Scanner requires 2 Electronics + 2 Sensors, and so on. Altogether, to produce **one Bio counter** requires the following raw materials:

- 6 Electronics
- 4 Sensors
- 1 Processor unit



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

- 8 Electronics
- 4 Sensors
- 2 Processor units



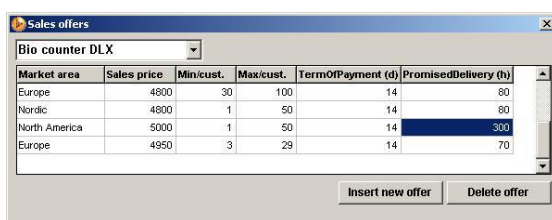
The production cell capacities are the following:

Production Cell	Capacity per hour	Capacity per shift	Capacity per day	Price for a new machine	Machine capacity
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

Capacity per day can be achieved by using all the three shifts. The above capacity 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 BioCounter DLX 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	20	5
Nordic	Air freight	48	10	10
Nordic	Courier Service	24	20	20
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. The Sub-Producers (from which you purchase Electronics and Processor units) are able to deliver their materials to you according to the Nordic delivery terms.

Waste Management

There will be some waste from your materials process. This waste comes, for example, from excessive raw material inventories. Luckily the waste that comes from your processes qualifies as a raw material for the SubProducers. The sales name for the waste is Recyclable Cilicon. Whenever you have this material in the inventory, you can negotiate about its sales with the SubProducers.

When you want to sell Recyclable Cilicon, you need to contact (by phone, Skype,...) the SubProducers in order to agree on the sales terms. When you have agreed on the sales terms with your customer, you create a Phone delivery through a decision called **Sub-contracting** (in the decision list in the game application) and enter the values you have agreed for the delivery.

Note that you will pay the delivery costs! Thus, remember to include the delivery cost in the sales price.

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	~15.000	~7.500	●●●●	●● - ●●●●●	●●●	●●●	●● - ●●●●	●●●●
Europe	~22.500	~15.000	●●●●●	●●●	●●	●●●	●●●	●●●●●
N-Am.	~9.000	~7.500	●●●●●	●●	●●	●●●	●● - ●●●	●●●●●

The market volume in the table is configured for 9 participating companies. Your share of the market volume in the beginning of the game will be approximately 1/9 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 simulation 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, you can think of the answers to these questions.

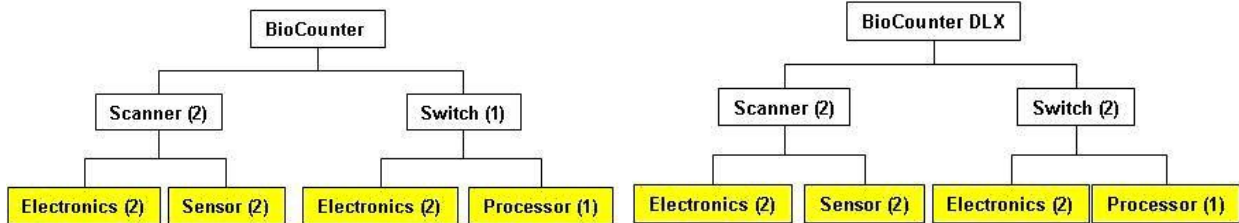
1. What are the main challenges of BioCounter Ltd?
2. What are the most important tasks of the Top Management Team?
3. Which are the factors that affect your success in VIBu simulation?
4. The total market volume is 46.000 Bio counters and 30.000 Bio counter DLXs per month and there are 9 competing companies. What is the share of sales you should aim at? So, how many BioCounters and BioCounter DLXs can you expect to sell per month?
5. Based on the previous calculations, how much raw materials are required per day to answer to the demand you calculated above?
 - Electronics?
 - Sensors?
 - Processor units?
6. Suppose that you order Sensors from the cheapest suppliers. How much Sensors you need to have in the inventory when you place the order, in order the Sensor inventory to last for production during the Sensor delivery? See the supplier table on the next page.

APPENDIX

RAW MATERIAL SUPPLIERS

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

PRODUCT HIERARCHIES



OUR OWN INVENTORY IN THE BEGINNING

Item	Type	Inventory (units)	Waste-% / day
Sensor	Raw material	4.000	0,5 %
Electronics	Raw material	5.000	0,5 %
Processor unit	Raw material	1.000	0,3 %
Scanner	Semi-finished	800	0,5 %
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	~15.000	~7.500	●●●●	●● - ●●●●●	●●●	●●●	●● - ●●●●	●●●●
Europe	~22.500	~15.000	●●●●●	●●●	●●	●●●	●●●	●●●●●
North-America	~9.000	~7.500	●●●●●	●●	●●	●●●	●● - ●●●	●●●●●

TERMS OF DELIVERY

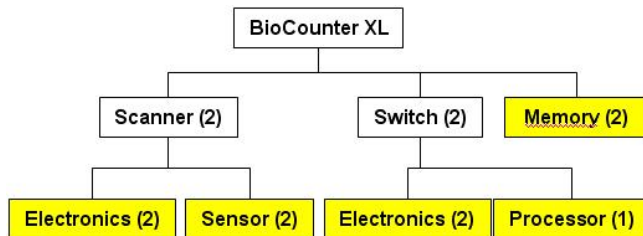
Market area	Delivery method	Duration (h)	Fixed cost	Cost/unit
Nordic	Truck	72	20	5
Nordic	Air freight	48	10	10
Nordic	Courier Service	24	20	20
Europe	Truck	72	100	50
Europe	Air freight	48	50	250
Europe	Courier Service	24	100	300
North America	Shipping	288	100	50
North America	Air freight	120	50	300
North America	Courier Service	48	100	350

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	2	100	14	80
Bio counter	Nordic	3.700	10	100	12	90
Bio counter	Europe	3.800	2	100	14	80
Bio counter	Europe	3.700	10	100	12	90
Bio counter	North America	4.000	2	100	14	300
Bio counter	North America	3.900	10	100	12	320
Bio counter DLX	Nordic	6.700	2	100	14	80
Bio counter DLX	Nordic	6.600	10	100	12	90
Bio counter DLX	Europe	6.700	2	100	14	80
Bio counter DLX	Europe	6.600	10	100	12	90
Bio counter DLX	North America	6.900	2	100	14	300
Bio counter DLX	North America	6.800	10	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 %