Muesli AG: Improving Operational Processes
(Prepared by Prof. Hillol Bala)

[Note: This case has been prepared based on a fictitious company, Muesli, created by the ERPsim Lab in HEC Montreal to simulate a company that uses the SAP ERP system for operational processes.]

Muesli is a popular breakfast dish. Dry muesli is primarily a mixture of rolled oats and wheat flakes, with nuts and pieces of dried fruit. According to Wikipedia, "Muesli was invented in 1900 by Swiss doctor Maximilian Bircher-Benner for patients in his hospital". Muesli was first popularized in Germany and Switzerland. In the late 1980s, the company Kellogg® marketed its brand Mueslix® in North America. Since then, an interest in Germany's local brand of muesli has developed. Today, dry muesli is widely available in the form of pre-packaged mixes. It can be stored for many months and served mixed with yogurt or milk, and pieces of fresh fruit. Some like it in hot milk. Muesli provides an excellent source of essential ingredients as it is rich in fiber and essential trace elements. In the local market, about 18,000 boxes of local brands of muesli per company per day were produced on average in 2006.

Your new company, Muesli AG, produces pre-packaged muesli boxes. The market is surprisingly fragmented. This could be explained by the fact that entry costs in the industry are relatively small. In 2006, there were eight local companies competing in this relatively small but competitive market. Each firm is located in a different city in Germany. Now there are twenty six companies.

You are part of a small executive team leading one of these companies. As a member of the executive team, you will have to make strategic decisions for a number of years. You will have to select the recipe for your products, forecast sales, plan production, make pricing decisions and determine the advertising budget. Your team will also be responsible for accounting functions, including reporting quarterly profits.

Make-to-stock business processes

Muesli AG is a make-to-stock manufacturer. It can only sell products that are held in inventory. Therefore, cereal boxes have to be manufactured in advance. This determines some of the business processes that your company will need to perform.

Your executive team will need to forecast the number of products the firm intends to sell in the next period. Based on this forecast, production is planned. Material requirements are met by purchasing raw materials from the appropriate supplier. Production is done in batches in keeping with production capacity constraints. Purchasing raw materials requires cash flow. If you choose to produce a large

number of boxes in advance, you will have to borrow the necessary funds from the bank on which you will have to pay interest.

Because this is a small company, your team will have to supervise almost all of the operations of the company and take an active part in some of the day-to-day processes. There are tasks that you simply cannot delegate and the success of your company depends on your team. Your responsibilities in operations could include some of the following processes within the full cash-to-cash cycle (See Exhibit 1 for an incomplete list of operational process activities).

More importantly, there is a list of managerial and strategic activities that you will have to undertake. The strategic decisions involve setting the price, allocating advertising expenditures, and choosing the recipes for your product. You will also have to manage your cash flow. This is hard and challenging work but this is why you accepted the job.

The ERP system

Considering all your responsibilities, your team will be kept pretty busy. Fortunately, the company has acquired a new ERP system: SAP™ ERP. Presumably, none of you has any practical experience with SAP™ ERP or another ERP system, but you are entrepreneurial and resourceful, so you are looking forward to fully exploiting the possibilities of the ERP system.
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ERP software is an integrated information system that manages enterprise data, helps integrate business processes and provides data for business intelligence. You will learn how to perform various operational tasks to plan production, order raw materials, produce goods, enter prices and advertising budgets, etc. As the system stores all relevant information on your company, you must learn to use the system to exploit that information. You will need to track purchasing orders, follow the evolution of production and inventory levels, draw financial reports, and acquire market business intelligence.

Improving Operational Processes

Your team is aware of the limitations of fragmented business processes and silo effects (i.e., different departments working in silos). In order to receive benefits from the planned SAP ERP system implementation, you will need to develop a process understanding of how different activities listed in Exhibit 1 are linked together and form a comprehensive (and integrated) operational process for Muesli.

Your task is to develop an integrated process diagram for Muesli (following Exhibit 1). Considering that the goal is to develop a high-level understanding of an integrated operational process, you do not need to follow any process-modeling notation (e.g., BPMN, activity diagram, data flow diagram, or flow chart). You just need to use boxes and arrows to show activities are linked together. You should also show groups of activities and label the groups appropriately. Create the diagram using any tool that you prefer, you must upload in the PDF format. Here is an example:

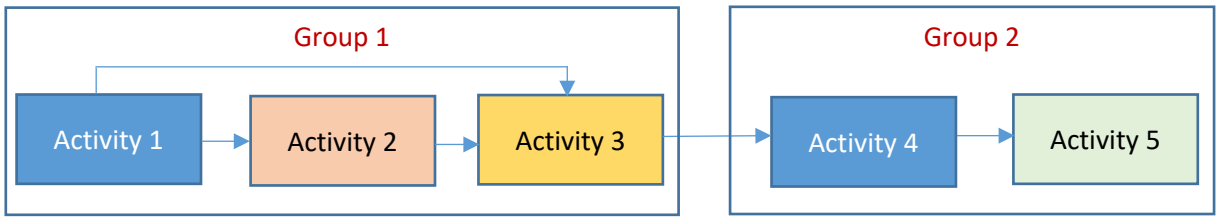


Exhibit 1: Activities Involved in Muesli's Operational Processes (incomplete)

ACTIVITIES	DESCRIPTION
Forecasting	All firms in the simulation are using a make-to-stock approach. Therefore, the sales manager needs to forecast demand each period.
Production Planning	Based on the forecasted sales units for the next period, the planner then performs materials requirements planning, generating a production plan and a purchasing plan.
Purchase Order Creation	From the purchasing plan, the purchasing manager contacts the suppliers of the products required. A formal purchase order is created and sent to the relevant suppliers.
Goods Receipt	Some time after each purchase order is sent, the materials will arrive at the factory. The receiving clerk checks that the goods delivered correspond to the purchase order and records a goods receipt, letting the warehouse know that the items can be put into storage and the rest of the company know that they are available for use.
Invoice Receipt	An invoice for the ordered materials is sent to accounting and checked against both the purchase order and the goods receipt by an accounting clerk. The clerk then records the invoice in the accounts payable ledger, so that it can be paid by the due date.
Outgoing Payment	Since the goods are payable upon an agreed term of payment, the accounting clerk carries out the transaction required to pay the supplier when it is time. A payment for the amount owed is made to the supplier.

Production Order Creation and Release	Once all raw materials required for production are available, the production plan can be put into action. The production controller reviews the plan, along with other information such as available inventory and decides what quantity of which product will be produced next. They create and release a production order to signal to the factory shop floor what to produce.
Production Execution and Confirmation	The raw materials required for production are transferred from the warehouse to the production line, and a goods issue is recorded to update inventory figures. Once the physical production run is complete, the production order is confirmed and the finished products are transferred from the production line to the warehouse. Once again to update inventory figures, a goods receipt is recorded. This lets the sales team know that this new inventory is now available for sale.
Sales Order Creation	Each day, several retailers will call your firm to confirm pricing and availability. The firm whose products best meet the needs of each store will secure the sale. If it is your firm, then one of your sales representatives will record a sales order.
Picking and Shipping	In response to seeing the new sales order, the warehouse will transfer the finished products to the shipping staging area where they will be prepared for transport, loaded and sent to the customer. Another goods issue is recorded to update inventory totals, and the sales order is updated as well.
Invoicing	After shipment, accounting will prepare and send an invoice to the customer. The clerk then records the invoice in the accounts payable ledger, so that it can be tracked to ensure payment by the due date.
Incoming Payment	Some time after the invoice is received, the customer will transfer funds to pay for their order. Upon receipt of payment from the customer, the accounting clerk clears the customer account and records the deposit of the payment.

Exhibit 2: Muesli Products and Bill of Materials

Nut	
$$-F01 $$-F11	500g 1kg

20% wheat*
30% oat*
20% nut*
1 box / 1 bag*

*minimum

Blueberry	
$$-F02 $$-F12	500g 1kg

20% wheat*
30% oat*
20% blueberry*
1 box / 1 bag*

*minimum

Strawberry	
$$-F03 $$-F13	500g 1kg

20% wheat*
30% oat*
20% strawberry*
1 box / 1 bag*

*minimum

Raisin	
$$-F04 $$-F14	500g 1kg

20% wheat*
30% oat*
20% raisins*
1 box / 1 bag*

*minimum

Original	
$$-F05 $$-F15	500g 1kg

20% wheat*
30% oat*
1 box / 1 bag*

*minimum

Mixed	
$$-F06 $$-F16	500g 1kg

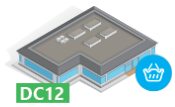
20% wheat*
30% oat*
30% fruits & nuts**
1 box / 1 bag*

*minimum
**At least some of all fruits/nut

Exhibit 2: Muesli Customers and Suppliers

CUSTOMERS

DC 10: Hypermarkets
Payment Time : 20
Approximate Market Size
€90 000 per team per week



DC 12: Grocery Chains
Payment Time : 10-20
Approximate Market Size
€220 000 per team per week

DC 14: Independant Grocers
Payment Time : 1-20
Approximate Market Size
€130 000 per team per week

SUPPLIERS

Lead time (days)	1-5
Payment time (days)	20

TRANSPORTATION COSTS

Main Warehouse to Regional Storage Location	€1 000

Exhibit 3: Muesli Customer Locations

	Hypermarkets	Grocery stores	Independent grocers	Total
West	3	17	40	60
South	7	23	38	68
North	2	19	45	66

Exhibit 4: Storage Capacity and Costs

STORAGE CAPACITY AND COSTS		
Product type	**Current space**	**Cost per additional 50,000 units***
Finished product	250,000 boxes	€500/day
Raw materials	250,000 kg	€1 000/day
Packaging (bags and boxes)	750,000 units	€100/day

**Billed automatically*

FIXED COSTS (€ paid each 5 days)*	
Direct labor	20 000
Factory overhead	15 000
S, G & A	40 000
Depreciation (Building)	1 250
Depreciation (Equipment)	50 000**

**Billed automatically*

Exhibit 5: Production Capacity and Setup Time

PRODUCTION CAPACITY	
Capacity (units/day)	24,000
Additional Capacity (€ per 1,000 units)	1 000 000**

***Investing in additional capacity will increase equipment depreciation costs*

SETUP TIME	
Setup time (hours)	**Investment** (€)
8	-
7	50 000
6	125 000
5	250 000
4	500 000
3	1 250 000