Managing your Company/Departments with Inter Department Coordination

It's time to unlock the doors and turn on the lights! Welcome to your company. Below, we will walk you through the mechanics of the company departments. Remember, entering decisions is the easy part; determining what decisions to enter requires some thought. This chapter will help you get started.

Every company starts the simulation with five sensor products. Your company has one product for each segment. You have one assembly line per product. New products can be created, and current products can be retired. Your company must have at least one product and cannot have more than eight. Your decisions, made every year on January 1, are carried out by your employees throughout the year.

> Your simulation might also include additional modules and plug-ins. Your simulation dashboard will notify you if these decisions are scheduled.

Research and Development

The Research and Development (R&D) Department oversees invention and redesign. It develops the innovations needed to keep the company ahead of the competition. R&D is responsible for the "product" portion of the 4 P's of Marketing ("product, price, place and promotion"). This makes R&D an essential part of any marketing process. Your R&D Department invents new products and changes specifications for existing products. Changing size and/or performance repositions a product on the Perceptual Map. Improving performance and shrinking size moves the product towards the lower right on the map. Your R&D decisions are fundamental to your Marketing and Production plans.

In Marketing, R&D addresses:

- The Positioning of each product inside a market segment on the perceptual map
- The number of products in each segment
- The Age of your products
- The reliability (MTBF rating) of each product

In Production, R&D affects or is affected by:

- The cost of material
- The purchase of new facilities to build new products
- Automation levels – The higher the automation level, the longer it takes to complete an R&D project.

All R&D projects begin on January 1. If a product does not have a project already under way, you can launch a new project for that product. However, if a project begun in a previous year has not finished by December 31 of that year, you will not be able to launch a new project for that product (the decision entry cells in the R&D area of the simulation will be locked).

Changing Performance, Size, and MTBF

Repositioning moves an existing product from one location on the perceptual map to a new location, generally (but not always) down and to the right. Repositioning requires a new Size attribute and/or a new Performance attribute. To keep up with segment drift, a product must be made smaller (that is, decrease its Size) and better performing (that is, increase its Performance).

Positioning Costs

Positioning affects material costs. The more advanced the positioning, the higher the cost. At the beginning of the simulation, the trailing edge of the Low End fine cut has the lowest positioning cost of approximately $1.00; the leading edge of the High End has the highest positioning cost of approximately $10.00.

Reliability (MTBF) Costs

The Reliability rating, or MTBF, for existing products can be adjusted up or down. Each 1,000 hours of Reliability (MTBF) adds $0.30 to the material cost. A product with 20,000 hours of Reliability includes $6.00 in reliability costs:

$$(\$0.30 \times 20{,}000) \,/\, 1{,}000 = \$6.00$$

Improving Positioning and Reliability will make a product more appealing to customers, but doing so increases material costs.

Material costs displayed in the simulation web app and reports are the combined Positioning and Reliability (MTBF) costs.

Inventing Sensors

The simulation allows you to expand your product base by inventing new products. To do so, click the + icon in the Products bar, select a name from the drop-down list, and then enter the product's Performance, Size and MTBF. Of course, these specifications should conform to the criteria of the intended market segment.

All new products require Capacity and Automation, which should be purchased by the Production Department in the year prior to the product's revision (release) date. If you don't buy the assembly line the year prior to its introduction, you cannot manufacture your new product!

It is not possible to produce new products prior to the revision date. A new product with a revision date of July 1 will be produced in the second half of the year. The Capacity and Automation will stand idle for the first half of the year.

Project Management

Segment circles on the perceptual map move at speeds ranging from 0.7 to 1.3 units each year, depending on your simulation. You must plan to move your products (or retire them) as the simulation progresses. Generally, the longer the move on the perceptual map, the longer it takes the R&D Department to complete the project.

Project lengths can be as short as three months or as long as three years. Project lengths will increase when the company puts two or more products into R&D at the same time. When this happens each R&D project takes longer. Assembly line Automation levels also affect project lengths. R&D project costs are driven by the amount of time they take to complete. A six-month project costs $500,000; a one-year project costs $1,000,000.

Sensors will continue to produce and sell at the old Performance, Size and MTBF specifications up until the day the project completes, shown on the spreadsheet as the revision date. Unsold units built prior to the revision date are reworked free of charge to match the new specifications.

> If the project length takes more than a year, the revision date will be reported in the next Capstone Courier. However, the new performance, size and MTBF will not appear; old product attributes are reported prior to project completion.

When products are created or moved close to existing products, R&D completion times diminish. This is because your R&D Department can take advantage of existing technology. If the module is active, TQM/ Sustainability investments can also decrease R&D times. It is important to verify completion dates after all decisions have been entered. Usually you want repositioning projects to finish in less than a year. For example, consider breaking an 18-month project into two separate projects, with the first stage ending just before the end of the current year and the second ending halfway through the following year.

A Sensor's Age

It is possible for a product to go from an Age of 4 years to 2 years. How can that be? When a product is moved on the Perceptual Map, customers perceive the repositioned product as newer and improved, but not brand new. As a compromise, the perceived age is cut in half. If the product's Age is 4 years, on the day it is repositioned, its Age becomes 2 years. Therefore, you can manage the age of a product by repositioning the product. It does not matter how far the product moves. Aging commences from the revision date.

Changing the MTBF alone will not affect a product's age.

Age criteria vary from segment to segment. For example, if a segment prefers an Age of 2 years and the product's age approaches 3 years, customers will lose interest. Repositioning the product drops the Age from 3 to 1.5 years, and customers will become interested again.

To test this, log in to your simulation and start in Research & Development. To change a product's performance, update the Performance cell or slider; to change its size, update the Size cell or slider. To change the Reliability rating, update the product's MTBF. As you vary the specifications, observe the effect upon the revision date, project cost, material cost and Age.