Situation Analysis

The Situation Analysis will help your company understand current market conditions and how the industry will evolve over the next eight years.

The analysis can be done as a group or you can assign parts to individuals and then report back to the rest of the company.

> An online version of the Situation Analysis is available in the Getting Started area.

The exercises require two reports: The Industry Conditions Report and The Foundation FastTrack, which are available from the website's Reports link. The FastTrack is also available from the Foundation Spreadsheet's Reports menu bar.

> The FastTrack available at the start of Round 1 displays the results for Round 0, when all companies are equal. If you access the report from the website, use the Round 0 FastTrack for the Situation Analysis.

The Situation Analysis has five parts:

- Perceptual Map
- Industry Demand Analysis
- Capacity Analysis
- Margin Analysis
- Consumer Report

1 Perceptual Map

The Research & Development Department can use the Perceptual Map exercise to plan revision and invention projects that meet customers' shifting size and performance expectations. The Marketing Department can use the results during forecasting as they compare competing products and when determining prices (in general, better positioned products can command higher prices).

Each segment has a set of circles. The inner fine cut circles have a radius of 2.5 units. They represent the heart of the segments where demand is strong. In addition, each inner circle has an ideal spot, a location where demand is strongest. The larger outer rough cut circles have a radius of 4.0 units. They represent the outer fringe of the segments where demand is weak.

1.1 Segment Centers and Segment Drift

Tables 1 and 2 in the Industry Conditions Report display information about segment drift.

Table 1 shows the yearly drift rates for each segment. For example, assume the center of the High Tech segment ends Round 0 (the year before the start of the simulation) with a performance of 6.7 and a size of 13.3, and the yearly drift rate for performance is +0.7 (customers want better performing products) and for size is -0.7

(customers want smaller products). At the end of Round 1 the center of the High Tech segment will have a performance of 7.4 and a size of 12.6.

$$6.7 + 0.7 = 7.4 \ and \ 13.3 - 0.7 = 12.6$$

Table 2 displays the segment center locations at the end of each round.

Print the Perceptual Map Form in the Industry Conditions Report then use Table 2 to find the location of each segment center for Rounds 1 through 8. Mark the approximate locations on the form (see the example in Figure 1).

> Remember, the locations in Table 2 are the centers of the segment circles, not product positions. Product positions are reported on page 4 of The Foundation FastTrack.

> The locations in Table 2 reflect the segment centers at the *end* of the round. Therefore, the Round 0 positions can be seen as the Round 1 *starting* positions, Round 2 positions can be seen as the Round 3 starting position, etc. Each month during the simulation year, the segment drifts 1/12th of the distance from the starting position to the ending position.
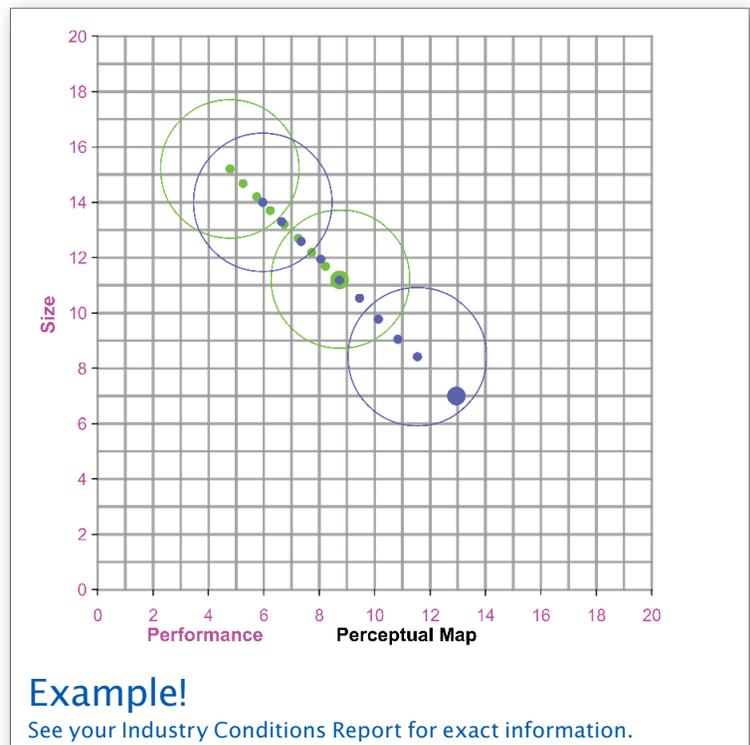
Example!
See your Industry Conditions Report for exact information.

Figure 1   Perceptual Map Form Example: Each year, customers expect smaller sensors with better performance. This causes the segment circles to "drift" to the lower right. The smaller dots represent the segment centers Rounds 0 through 8. The larger dots represent each segment's ideal spot location at the end of Round 8.

1.2 Ideal Spots

Customer positioning preferences are reported in the Segment Analysis pages of The Foundation FastTrack. Within each analysis, the Buying Criteria box displays the ideal performance and size as of December 31 of the previous year. This ideal position is also called the ideal spot. If all other criteria are equal, a customer will prefer a product that is located nearer the ideal spot over a product that is located farther from it.

> The High Tech segment places a higher level of importance on positioning than the Low Tech segment.

Within each segment, the ideal spot is at a position relative to the center of the circle. Offsets are reported in Table 3 of the Industry Conditions Report. For example, because the High Tech segment wants cutting edge sensors, its ideal spot is ahead of the center. Suppose the High Tech center is at Performance 7.4 and Size 12.6. Ideally High Tech customers want more performance and smaller size. If Table 3 reports "High Tech. Performance + 0.9 | Size -0.9," then the ideal spot would be at:

Performance 7.4+0.9 = 8.3 *and* **Size 12.6-0.9=11.7**

Use Tables 2 and 3 to determine each segment's ideal spot for Rounds 1 through 8. Enter the results in Form 1.

On the Perceptual Map Form, mark the Round 8 ideal spot for each segment.

Form 1   Segment Ideal Spot Locations

Low Tech				High Tech		
Round	Pfmn	Size		Round	Pfmn	Size
0				0		
1				1		
2				2		
3				3		
4				4		
5				5		
6				6		
7				7		
8				8		

2 Industry Demand Analysis

The Industry Demand Analysis will help the Marketing and Production Departments understand future demand. Marketing can use the total demand for each segment as it creates forecasts. Production can use the results when making capacity buy and sell decisions.

You will need the Segment Analysis reports (pages 5 - 6) of The Foundation FastTrack for Round 0 and the Industry Conditions Report.

At the top of each Segment Analysis page you will find a box called Statistics. On Form 2, copy the Total Industry Unit Demand number for each segment into the Demand cell for Round 0. Next, copy the Next Year's Growth Rate, which is also in the Statistics box, into the Rate cell.

Multiply the Round 0 demand by the growth rate and add the result to the Round 0 demand. This will give you a close approximation of Round 1 demand. Copy this number into the Demand cell for Round 1.

If you prefer, you can use the following shortcut. First, convert the growth rate percentage to a decimal. For example, assume the Low Tech growth rate is 10.0%. Convert the percentage to a decimal:

$$\text{Low Tech Segment Growth Rate} = 10.0\%$$
$$= 0.1$$

Add 1 to the decimal:

$$1 + 0.1 = 1.1$$

Multiply the Round 0 Low Tech demand by 1.1. This will give you a close approximation of Total Industry Demand for Round 1.

> Remember, the demand numbers are in thousands! For example, if the Round 0 Total Industry Unit Demand for the Low Tech segment reads 7,387, the Low Tech Segment demanded 7,387,000 units.

While you can calculate the demand for Round 1 from the information on hand, future growth rates are unknown. Can you predict the market size for Rounds 2 to 8? No. On the other hand, you need something for planning purposes to address critical questions like, "How much production capacity will we need in the future?" "How much money do we need to raise?" "Is one segment more attractive for investment?"

Planners address this type of issue with scenarios. Typically there are three– worst case, average case, and best case. The average case assumes that the current growth continues into the future indefinitely. Worst case assumes a lower growth rate. Best case a higher growth rate. The truth will unfold as the simulation progresses. Next year's growth rate is published in the FastTrack on each Segment Page in the Statistics box.

For your purposes, complete Form 2 with the "average" scenario. Assume the Round 1 growth rates will continue into the future unchanged. This will give you some idea for potential market size. If you have time, try a worst case and best case scenario. For worst case assume, say, half the growth rate. For best case assume, say, 1.5 times the growth rate. (Consider developing a simple spreadsheet for this purpose.)

Form 2   Demand Analysis

Low Tech			High Tech		
Round	Demand	Rate	Round	Demand	Rate
0			0		
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		

Form 3   Capacity Analysis

Product Name	First Shift Capacity		First & Second Shift Capacity		Automation Level	Cost to Double Capacity	Cost to Raise Automation to 10.0
	Company	Industry	Company	Industry			

3 Capacity Analysis

The Industry Demand Analysis indicates the sensor market is growing. The Capacity Analysis will help the Production and Finance Departments anticipate the cost of adding capacity and automation.

Enter the name of your company's product in the Product Name column of Form 3. You will find this information in the Production Analysis, page 4 of The Foundation FastTrack for Round 0. The name of your product starts with the first letter of your company's name. If you are not yet assigned to a company use the Andrews Company information.

Next, find the First Shift Capacity in the Capacity Next Round column of the Production Analysis. This number (in thousands) indicates the amount of sensors that can be built over the course of a year using a single, eight-hour shift. In Form 3 , enter the Capacity Next Round into the column under First Shift Capacity, Company.

Multiply the First Shift Capacity, Company by the number of active companies in your simulation (page 1 of the FastTrack displays each company name). This indicates the number of units that can be built for the segment by the entire industry using a single shift over the course of a year. Place the result in the First Shift Capacity, Industry column.

Production schedules that exceed the First Shift Capacity require hiring a second shift. Multiply the First Shift Capacity, Company by 2 and place the result in the First & Second Shift, Company column.

Multiply the First Shift Capacity, Industry by 2 and place the result in the First & Second Shift, Industry column. Copy the value for Automation Next Round from the Production Analysis into the Automation Level column.

Use the formulas below to calculate the cost to double capacity and the cost to raise automation to 10.0.

Cost to Double Capacity = First Shift Capacity * [$6 + ($4 * Automation Level)]

Cost to Increase Automation to 10.0 = First Shift Capacity * [$4 * (10 - Automation Level)]

> Increases in capacity and changes in automation require a year to implement.

4 Margin Analysis

Healthy margins, the difference between a product's manufacturing cost and its price, are critical to company success. The Margin Analysis will help the Research & Development Department understand the cost of material, and the Production Department understand the effect automation has on labor costs. It will also demonstrate to the Marketing Department the importance of adequate pricing, and to the Finance Department the upper limits of profitability.

Enter the name of your company's product in the Product Name column in Form 4. You will find this information in the Production Analysis, page 4 of The Foundation FastTrack for Round 0. The name of your product starts with the first letter of your company's name. If you are not yet assigned to a company, use the Andrews Company information.

Next, enter your product's price, material cost and labor cost.

Calculate the Contribution Margin:

Contribution Margin = Price - (Material Cost + Labor Cost)

Calculate the Margin Percentage:

Margin Percentage = Contribution Margin / Price

Enter the results into Form 4.

> As a simplifying measure, the Margin Analysis does not include Inventory Carrying Costs in the Contribution Margin equation.

Form 4   Margin Analysis

Product Name	Price	Material Cost	Labor Cost	Contribution Margin	
				$	%

4.1 Margin Potential

Use Form 5 to determine the margin potential. Go to the Buying Criteria on the Segment Analysis pages of The Foundation FastTrack for Round 0 to find the maximum permitted price and the minimum acceptable MTBF (Mean Time Before Failure) for each segment (lowering the MTBF decreases material cost).

Determine the minimum Material Cost per segment using the following equation (see Table 2 for an example):

Minimum Material Cost = [(Lowest Acceptable MTBF * 0.30) / 1000] + Trailing Edge Positioning Cost in Table 1

Determine the minimum Labor Cost for each segment. Assume a base labor cost of $11.20.

> $11.20 is a rough estimate of the labor cost, it is used solely to illustrate the Margin Potential concept.

Minimum Labor Cost = [$11.20 - (1.12 * Automation Ratings below)] + 1.12

- Low Tech Automation: 10.0
- High Tech Automation: 6.0

Find the Contribution Margin dollars and Contribution Margin percent:

Contribution Margin = Price - (Material Cost + Labor Cost)

Margin Percentage = Contribution Margin / Price

> As a simplifying measure, the Margin Analysis does not include Inventory Carrying costs in the Margin Potential equation.

Table 1 Material Positioning Component Costs: These costs are for the beginning of Round 1. They are used solely to illustrate the Margin Potential concept.

	Trailing Edge Cost	Leading Edge Cost
Low Tech	$1.50	$8.00
High Tech	$4.00	$10.00

Table 2 Minimum Material Costs for the High Tech Segment: Assumes the High Tech minimum reliability is 17,000. Use the High Tech Segment Analysis to determine the exact value.

Minimum Reliability Component Cost	(17,000 * 0.30) / 1000 = $5.10
Trailing Edge Positioning Component Cost	$4.00
Total	$9.10

Form 5 Margin Potential

Segment	Maximum Price	Minimum Material Cost	Minimum Labor Cost	Contribution Margin $	%
Low Tech					
High Tech					

5 Consumer Report

The Consumer Report will help the Research & Development Department understand the need to design quality products and the Marketing Department the importance of adequate pricing, sales budget and promotion budget decisions.

You will need the Buying Criteria from the Segment Analysis pages and the Production Analysis in the Round 0 FastTrack. If you are not yet assigned to a company, use the Andrews Company information.

Enter your ratings to the categories in Form 6.

Price: Award an A if your product's price is in the bottom third of the expected price range, B if it is in the middle third and C if it is in the top third. You can find the price in the Production Analysis.

Reliability: Award an A if the MTBF specification is in the top third of the range, B if it is in the middle third and C if it is in the bottom third.

Age: Award an A if the age on December 31 is within 0.5 years of the ideal age, B if the age is 0.6 to 1 year and C if the age is beyond 1 year.

Positioning: Award an A if your product is within 0.5 units of the segment's ideal spot, B if it is 0.6 to 1.5 units away and C if it is beyond 1.5 units.

Awareness: Award an A if your product's awareness exceeds 80%, B if it is 50% to 80% and C if it is below 50%.

Accessibility: Award an A if your product's accessibility exceeds 80%, B if it is 50% to 80% and C if it is below 50%.

In the Overall row, give your product an A only if the top two buying criteria for the segment (as listed in The Foundation FastTrack Segment Analysis reports or the Industry Conditions Report) were rated A, and if the awareness and accessibility were rated at least a B. Give your product a B if the top two attributes were at least a B and awareness and accessibility were at least a B. Otherwise, give your product a C.

> Form 6 analyzes the criteria that drive the Customer Survey scores.

Form 6   Consumer Report

Low Tech		High Tech	
Price		Price	
Reliability		Reliability	
Age		Age	
Positioning		Positioning	
Awareness		Awareness	
Accessibility		Accessibility	
Overall		Overall	