***T**he "plant" refers to the tie among strategy, sales, employment, and practices, whether it is a plant, company, or strategic business unit**.**

***Although exact are preferred, your answers may be approximate.**

Section DM: Demographics

DM01 Approximately how many total employees work for the plant? _____employees

DM02 How many of these employees are production workers (direct and indirect)? _____workers

DM03 Approximately how many total engineers are at this plant? _____engineers

DM04 Approximately what percent of the direct production workers is contract or temporary? _____% of workers

DM05 How many product lines or product families does the plant produce? _____product lines or families

DM06 What percent of plant sales comes from the plant's largest selling product line? _____% of sales

DM07 Over the last two years, what has been the utilization rate for machinery/equipment? _____% utilization rate

DM08 What is the approximate average age of the plant's production equipment? _____years

DM09 On average, over the last two years, about what **percent of annual sales** has been invested in new manufacturing equipment at this plant? _____% of annual sales

DM10 What percent of the plant ownership is international? _____%

DM11 What percent of plant sales is currently from products that have been introduced in the last two years? _____%

DM12 What were the plant's sales last year? (State currency units.) _____total sales

DM13 What percent of the plant's sales is generated from exports? _____% export sales

DM14 About what percent of the plant's **sales** is the total manufacturing cost? _____% of sales

DM15 About what percent of the plant's total manufacturing cost is for labor? _____% of cost

DM16 About what percent of the plant's total manufacturing cost is for material? _____% of cost

DM17 What percent of your plant material costs are purchased from international sources? _____%

DM18 (A, B & C) What percent of the machines in the plant are

grouped by machine type (e.g., all lathes together) _____%
grouped by product or product families (e.g., manufacturing cells_____%
grouped by assembly line_____%

Section CG. Competitive Goal Measurement

Given the following goals, rate the extent that the plant is evaluated by top management? (Totals to 100 points)?

Overall Competitive Goal	**Weight percentage**
CG01.A Cost (Price)	_____Points
CG01.B Quality (conformance to specifications)	_____Points
CG01.C Delivery timeliness	_____Points
CG01.D Product Variety/Volume	_____Points
CG01.E New Product Design/Innovation	_____Points
CG01.F Environment/Safety	_____Points
Total (Sums to 100 Points)	**100 Points**

For each of the items listed below, how does your plant's performance compare with your competitors? (Circle a number.)

	Far Worse			Competitive			Far better
CG02 direct manufacturing costs	1	2	3	4	5	6	7
CG03 total product costs	1	2	3	4	5	6	7
CG04 raw material costs	1	2	3	4	5	6	7
CG05 product features	1	2	3	4	5	6	7
CG06 product performance	1	2	3	4	5	6	7
CG07 perceived overall product quality	1	2	3	4	5	6	7
CG08 order fulfillment speed	1	2	3	4	5	6	7
CG09 delivery speed	1	2	3	4	5	6	7
CG10 delivery as promised	1	2	3	4	5	6	7
CG11 delivery flexibility	1	2	3	4	5	6	7
CG12 flexibility to change output volume	1	2	3	4	5	6	7
CG13 flexibility to change product mix	1	2	3	4	5	6	7
CG14 manufacturing throughput time	1	2	3	4	5	6	7
CG15 new product design time	1	2	3	4	5	6	7

Using an index of 100 as the starting point 2 years ago, give <u>an approximate index</u> for the following (e.g., a 5% increase would be 105, a 5% decrease would be 95).

CG16 Manufacturing cost (without inflation) _____index
CG17 Labor productivity _____index
CG18 Equipment productivity _____index

What are the plant's approximate reject/return percentages at each of the following stages now and two years ago?

	Currently	**Two years ago**
CG19 (A&B) Percent rejects of incoming material	**_____%**	**_____%**
CG20 (A&B) Percent rejects during processing (scrap rate)	**_____%**	**_____%**
CG21 (A&B) Percent rejects at final inspection	**_____%**	**_____%**
CG22 (A&B) Percent returns from the customer	**_____%**	**_____%**

	Currently	**Two years ago**
CG23 (A&B) What percentage of the plant's customer orders is **delivered late?**	_____%	_____%
CG24 (A&B) What percent of the plant's purchase orders do suppliers deliver late?	_____%	_____%

Using 100 as the base 2 years ago, give the current index for the following (e.g., a 20% decrease would be 80).

CG25 Product design time _____index
CG26 Cycle time _____index
CG27 Manufacturing throughput time _____index
CG28 Delivery speed _____index

CG29 By sales volume, what are the **top four product lines** at this plant (if less than 4 leave others blank):
1._____ 2._____ 3._____ 4._____

CG30 What percent of your customer orders require after-sales service from this plant? _____%

CG31 What percent of the cost of goods sold is spent on transportation costs to the customer. _____%

Approximately, how many calendar days into the future have the plant promised delivery?

	Currently	2 years ago
CG32 (A&B) minimum days to delivery promise date	____Days	____Days
CG33 (A&B) maximum days to delivery promise date	____Days	____Days
CG34 (A&B) usual days to delivery promise date	____Days	____Days

On average, what percentage of the plant's orders is delivered to customers **after** the promised date?

	Currently	2 years ago
CG35 (A&B) Percent of orders delivered **after** promised date	_____%	_____%

For customer orders that are **delivered late**, what is the average number of days late?

	Currently	2 years ago
CG36 (A&B)average number of days late	_____Days	____Days

Section IP: Internal Manufacturing Practices

About how much time elapses from the start of the first operation until a batch of the plant's products is finished

	Now	2 years ago
IP01 (A&B) average time from start to completion	_____ days	_____ days

IP01 (A&B) For about how many individual products or product lines does the plant develop production plans?
_____ products in production plan _____ product lines in production plan

IP02 How far into the future does the plant's production plan extend? _____weeks

IP03 About how many times per year is the plant's production plan revised? _____ times per year

IP04 How far into the future does the plant freeze the production schedule? (0 = the firm does not freeze the production schedule.) _____weeks

How accurate are these manufacturing records?

IP05 About how accurate are the plant's inventory records (0 = do not measure)?	_____%
IP06 About how accurate are the plant's bills of material (0 = do not measure)?	_____%
IP07 About how accurate are routings (0 = do not measure)?	_____%

IP08 On approximately what percent of orders do engineering changes occur after the start of production? _____%

IP09 (A, B, &C) What is the approximate percentage breakdown of the production elapsed time for a typical production batch (These should sum to 100%)?
_____% set-up time _____% processing time _____% non-processing operations (queue & move time)

IP10 (A, B, &C) What is the approximate total number of part numbers in each segment of the plant's inventory system?
_____raw material part numbers _____component part numbers _____finished goods part numbers

IP11 What is the approximate value of the plant's total inventory in all stages of production including finished goods? (State currency units.) _____total inventory value

IP12 (A,B, &C) What is the approximate distribution of the plant's inventory value? (These should sum to 100%.)
_____% purchased materials and parts _____% work-in-process_____% finished goods

IP13 (A, B, C &D) In this plant, what percent of production (manufacturing) orders are in these categories (sums to 100%):
_____% one of a kind _____% small batch _____% large batch _____ % semi-continuous _____% continuous

IP14 (A, B, C &D) In this plant, what percent of manufacturing orders fall into these categories?
_____% Engineer to order _____% Made to order _____% Assemble to order _____% Made to stock

IP15	Approximately, how many items are on a typical end item bill of material (check one)?	**<50** □	**50-100** □	**100-200** □	**200-300** □	**300-400** □	**400-500** □	**500-1000** □	**1000-5000** □	**5000+** □

IP16	Approximately, how many annual permanent changes are made to this plant's bills of materials?	**<50** □	**50-100** □	**100-200** □	**200-300** □	**300-400** □	**400-500** □	**500-1000** □	**1000-5000** □	**5000+** □

IP17 About how many suppliers does the plant have, on average, per part? _____suppliers per part

In the last two years, to what extent has the plant invested resources (money, time and/or people) in programs in the following areas? (Circle a number for each program.)

	Not At All			To Some Extent			To a Great Extent
IP18 Cellular Manufacturing	1	2	3	4	5	6	7
IP19 Factory Automation	1	2	3	4	5	6	7
IP20 Process Redesign	1	2	3	4	5	6	7
IP21 Enterprise Resource Planning (e.g., SAP)	1	2	3	4	5	6	7
IP22 Material Requirements Planning	1	2	3	4	5	6	7
IP23 Just-In-Time	1	2	3	4	5	6	7
IP24 Manufacturing Throughput Time Reduction	1	2	3	4	5	6	7
IP25 Setup Time Reduction	1	2	3	4	5	6	7
IP26 Total Quality Management	1	2	3	4	5	6	7
IP27 ISO 9000 Certification	1	2	3	4	5	6	7
IP28 Supplier Certification	1	2	3	4	5	6	7
IP29 Statistical Process Control	1	2	3	4	5	6	7
IP30 Total Quality Management	1	2	3	4	5	6	7
IP31 Six Sigma (Green belt/ Black Belt)	1	2	3	4	5	6	7
IP32 ISO 14000 Certification	1	2	3	4	5	6	7
IP33 Pollution Prevention	1	2	3	4	5	6	7
IP34 Recycling Of Materials	1	2	3	4	5	6	7
IP35 Waste Reduction	1	2	3	4	5	6	7
IP36 Work Place Health And Safety	1	2	3	4	5	6	7

IP37 Approximately what percent of the parts and components that comprise the plant's products are fabricated within the plant? _____% fabricated in plant

Assume a normal demand for a month to be 100, what would be the:
IP38 demand level for a "peak" month (e.g., 20 % more than normal = 120) 'Peak' Month =_____
IP39 demand level for a "trough" month (e.g., 30 % less than normal = 70) 'Trough' Month= _____

IP40 For an individual product, what percent would be the forecast error for two months in the future? _____%

IP41 For the total sales for this plant, what percent would be the forecast error for 24 months in the future? _____%

Section MT Research Method: To be filled in by the Academic Researcher

MT01_____

MT02_____

