GLOBAL MANUFACTURING RESEARCH GROUP
MANUFACTURING PRACTICES SURVEY

1. Company Description and Background Information

The information in this section of the survey will be useful to researchers in studying relationships between company characteristics and manufacturing practices. As with the answers to questions in subsequent sections of the survey, the information that you provide will not be used to identify individual companies. Feel comfortable giving **approximate responses**; in most cases, our research has shown that it is important to have approximate answers than none at all.

> In this survey, we have used the word "company" to represent the unit for which you are answering questions. We ask that you be consistent throughout the survey and report the sales, employment, practices, etc. for the unit, whether it is a company, strategic business unit or plant.

1.01 **Approximately** how many employees work for the company? _____employees

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

1.03 About what percent of the production workers are contract or temporary? _____% of workers

1.04 How many hours per year does a production employee typically work? _____hours per year

1.05 How many product lines or product families does the company produce? _____product lines or families

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

1.07 About what percent of the company's products are make-to-order? _____% make-to-order

1.08 What percent of the machines in the company is grouped as follows?

_____% of machines grouped by machine type (e.g., all lathes together)

_____% of machines grouped by product or product families (e.g., manufacturing cells)

1.09 On average, over the last two years, what has been the capacity utilization rate for plant machinery or equipment?

_____% capacity utilization rate

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

1.11 What were the company's sales **2 years ago**? (State currency units.) _____total sales

1.12 What percent of the company's sales last year was for export? _____% export sales

1.13 What percent of the company's sales **2 years ago** was for export? _____% export sales

1.14 What percent of the ownership of the company is each of the following? (These should sum to l00%.)

_____% domestic (within the country) _____% foreign (outside the country)

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

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

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

1.18 What is the approximate average age of the company's production equipment? _____years

1.19 On average, over the last two years, about what **percent of annual sales** has been invested in new manufacturing equipment?

_____% of annual sales

1.20 Approximately how many suggestions are offered per year per employee? _____suggestions

1.21 Approximately how many employees are absent per day? _____employees

1.22 Approximately how many employees leave the company a year? _____employees

1.23 For each of the items listed below, how does the company compare with its competitors? (Circle a number.)

	far worse than competitors						far better than competitors
production costs	1	2	3	4	5	6	7
total product costs	1	2	3	4	5	6	7
supply chain costs	1	2	3	4	5	6	7
product features	1	2	3	4	5	6	7
product performance	1	2	3	4	5	6	7
perceived overall product quality	1	2	3	4	5	6	7
supply chain integration	1	2	3	4	5	6	7
order fulfillment speed	1	2	3	4	5	6	7
delivery speed	1	2	3	4	5	6	7
delivery as promised	1	2	3	4	5	6	7
delivery flexibility	1	2	3	4	5	6	7
flexibility to change output volume	1	2	3	4	5	6	7
flexibility to change product mix	1	2	3	4	5	6	7
manufacturing throughput time	1	2	3	4	5	6	7
product design time	1	2	3	4	5	6	7
solid waste disposal	1	2	3	4	5	6	7
air emissions	1	2	3	4	5	6	7
water emissions	1	2	3	4	5	6	7
health and safety record	1	2	3	4	5	6	7
ISO certifications	1	2	3	4	5	6	7

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

	not at all						to a great extent
cellular manufacturing	1	2	3	4	5	6	7
factory automation	1	2	3	4	5	6	7
process redesign	1	2	3	4	5	6	7
enterprise resource planning (e.g., SAP)	1	2	3	4	5	6	7
just-in-time	1	2	3	4	5	6	7
material requirements planning	1	2	3	4	5	6	7
manufacturing throughput time reduction	1	2	3	4	5	6	7
setup time reduction	1	2	3	4	5	6	7
ISO 9000 certification	1	2	3	4	5	6	7
supplier certification	1	2	3	4	5	6	7
statistical process control	1	2	3	4	5	6	7
total quality management	1	2	3	4	5	6	7
ISO 14000 certification	1	2	3	4	5	6	7
pollution prevention	1	2	3	4	5	6	7
recycling of materials	1	2	3	4	5	6	7
waste reduction	1	2	3	4	5	6	7
work place health and safety	1	2	3	4	5	6	7

2. Sales Forecasting

This section of the survey is about the methods that the company uses to anticipate demand for its products. We have found that manufacturing firms use a wide range of methods, and that both formal and informal approaches are effective. Thus, as with the other sections, your answers will provide us with insights about actual company practices, and there are no right or wrong answers. Please note, also, that for questions that ask for numerical answers, your answers may be **approximate.**

2.01 Which of the following best describes the **position** (level) of the person who has the **primary** authority for producing the company's sales forecasts? (Mark only one.)

❒ president/CEO/managing director
❒ vice president/director
❒ department/division head
❒ group/section manager

2.02 Which of the following best describes the **function** of the person who has the **primary** authority for producing the company's sales forecasts? (Mark only one.)

❒ administration
❒ planning
❒ production
❒ engineering
❒ sales
❒ marketing
❒ finance
❒ accounting

2.03 To what extent does the company use these techniques for sales forecasting? (Circle a number for each.)

	not at all						to a great extent

quantitative models (e.g., regression)	1	2	3	4	5	6	7
qualitative models (e.g., survey)	1	2	3	4	5	6	7
management opinion	1	2	3	4	5	6	7

2.04 To what extent is each of the following considered in the company's forecast? (Circle a number for each.)

	not at all						to a great extent
current economic conditions	1	2	3	4	5	6	7
customer information	1	2	3	4	5	6	7
supplier information	1	2	3	4	5	6	7
results of market research	1	2	3	4	5	6	7
current order backlog	1	2	3	4	5	6	7

2.05 To what extent is the company's sales forecast used for the following purposes? (Circle a number for each.)

	not at all						to a great extent
budget preparation	1	2	3	4	5	6	7
production planning	1	2	3	4	5	6	7
subcontracting decisions	1	2	3	4	5	6	7
material/inventory planning	1	2	3	4	5	6	7
sales planning	1	2	3	4	5	6	7
human resource planning	1	2	3	4	5	6	7
new product development	1	2	3	4	5	6	7
facilities planning	1	2	3	4	5	6	7
equipment purchase planning	1	2	3	4	5	6	7

2.06 For about how many individual products or product lines does the company develop forecasts?

_____products are forecast _____product lines are forecast

2.07 How many months into the future does the company forecast (e.g., the time horizon)? _____months

2.08 What is the smallest time period into which the time horizon of the company's sales forecast is divided? (Please mark only one.)

❒ days ❒ weeks ❒ months ❒ years

2.09 What has been the **approximate** average percent forecast error over the past two years? _____% error

2.10 How many times per year is the company sales forecast modified? _____times per year

2.11 What percent of the company's sales forecasts do production personnel change for production planning purposes?

_____% changed

3. Production Planning and Scheduling

This section is about your company's practices in the areas of planning and scheduling production. Planning refers to activities that express units of production and inventory in aggregated terms for the purpose of specifying overall output and capacity requirements for several months or even years into the future. Scheduling refers to more detailed

activities (often known as master production scheduling) that determine the timing and output levels for specific products or components in the next weeks or months.

3a. Production Planning
(Having to do with aggregated units for the next several months)

3.01 For about how many individual products or product lines does the company develop production **plans**?

_____ products in production plan _____ product lines in production plan

3.02 How far into the future does the company's production plan extend? _____months

3.03 What is the smallest increment into which the company's production plan is divided? (Mark only one.)

❒ days ❒ weeks ❒ months ❒ years

3.04 About how many times per year is the company's production plan revised? _____times per year

3.05 To what extent is each of the following factors considered in the development of the company's production plan? (Circle a number for each factor.)

	not at all						to a great extent
customer order backlogs	1	2	3	4	5	6	7
previous sales	1	2	3	4	5	6	7
machine capacity	1	2	3	4	5	6	7
labor capacity	1	2	3	4	5	6	7
customers' future plans	1	2	3	4	5	6	7
inventory levels	1	2	3	4	5	6	7
the forecast	1	2	3	4	5	6	7

3.06 How often are the following considered when subcontracting or outsourcing? (Circle a number for each.)

	never						very often
excess production load at your company	1	2	3	4	5	6	7
production difficulty at your company	1	2	3	4	5	6	7
top management directive	1	2	3	4	5	6	7
subcontracting allows earlier delivery dates	1	2	3	4	5	6	7
subcontractor's costs are lower	1	2	3	4	5	6	7
subcontractor's quality is higher	1	2	3	4	5	6	7

3.07 When **demand exceeds capacity**, how often does the company respond in each of the following ways? (Circle a number for each alternative.)

	never						very often
hire more workers	1	2	3	4	5	6	7
use overtime	1	2	3	4	5	6	7

add shifts	1	2	3	4	5	6	7
subcontract production work	1	2	3	4	5	6	7
backlog customer order	1	2	3	4	5	6	7
lease temporary capacity	1	2	3	4	5	6	7
turn away customers	1	2	3	4	5	6	7

3.08 When **demand is less than capacity**, how often does the company respond in each of the following ways? (Circle a number for each alternative.)

	never						very often
lay off workers	1	2	3	4	5	6	7
allow idle capacity	1	2	3	4	5	6	7
eliminate shifts	1	2	3	4	5	6	7
reduce work day or week	1	2	3	4	5	6	7
build inventory	1	2	3	4	5	6	7
lease capacity to others	1	2	3	4	5	6	7

3.09 To what extent is the company's production plan used for the following purposes? (Circle a number for each.)

	not at all						to a great extent
budget preparation	1	2	3	4	5	6	7
production planning	1	2	3	4	5	6	7
subcontracting decisions	1	2	3	4	5	6	7
material/inventory planning	1	2	3	4	5	6	7
sales planning	1	2	3	4	5	6	7
human resource planning	1	2	3	4	5	6	7
facilities planning	1	2	3	4	5	6	7
equipment purchase planning	1	2	3	4	5	6	7
new product development plans	1	2	3	4	5	6	7

3b. Production Scheduling
(This has to do with products, product lines or components over the next few weeks or months)

3.10 How far into the future does the company's production **schedule** extend? _____weeks

3.11 What is the **smallest** time increment of the company's production schedule? (Mark only one.)

❒ days ❒ weeks ❒ months ❒ years

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

3.13 How good are the factors that affect your ability to schedule effectively?

About how accurate are the company's inventory records (0 = do not measure)? _____%

About how accurate are the company's bills of material (0 = do not measure)? _____%

About how accurate are routings (0 = do not measure)? _____%

4. Shop Floor Control

Shop floor control refers to the set of operating-level activities associated with the implementation of detailed production schedules. This includes decisions about lot sizes, when to start a production order, sequencing at work centers, and when to make changes in the schedule. Our research has shown that a wide range of practices is used. As with the other sections, your answers to these questions will assist us in understanding actual practices.

4.01 Which of the following best describes the **position** of the person in the company who authorizes the plant to start work on an order? (Mark only one.)

❒ president/CEO/managing director
❒ vice president/director
❒ department/division head
❒ group/section manager

4.02 Which of the following best describes the **functional group** in the company who authorizes the plant to start work on an order? (Mark only one.)

❒ administration ❒ production ❒ sales ❒ finance
❒ planning ❒ engineering ❒ marketing ❒ accounting

4.03 On approximately what percent of orders do **customers make changes** after the start of production?

_____% of orders

4.04 On approximately what percent of orders do **engineering changes** occur after the start of production?

_____% of orders

4.05 What is the approximate percentage breakdown of the production time for a typical production batch?

_____% of elapsed factory time spent in set-up operations

_____% of elapsed factory time spent on other processing operations

_____% of elapsed factory time spent on non-processing operations (queue time, move time)

4.06 To what extent is each of the following considered in company decisions to authorize start of work on a production order? (Circle a number for each factor.)

	never						very often
actual customer order	1	2	3	4	5	6	7
production plan	1	2	3	4	5	6	7
detailed production schedule	1	2	3	4	5	6	7
parts shortage list	1	2	3	4	5	6	7
inventory level	1	2	3	4	5	6	7
importance of the customer	1	2	3	4	5	6	7
idle labor or equipment available	1	2	3	4	5	6	7

4.07 How often is the processing sequence at machines or work centers in the company established by the following criteria? (Circle a number for each factor.)

	never						very often
order in which jobs arrive	1	2	3	4	5	6	7
customer order due date	1	2	3	4	5	6	7
processing time of the job	1	2	3	4	5	6	7
work remaining at subsequent stations	1	2	3	4	5	6	7
minimize number of set-ups	1	2	3	4	5	6	7

top management directive	1	2	3	4	5	6	7
how easy or difficult the job is	1	2	3	4	5	6	7
past experience	1	2	3	4	5	6	7

4.08 How often does each of the following factors **change** the company's production schedule priorities **after** the plant has started an order? (Circle a number for each factor.)

	never						very often
pressure from customer	1	2	3	4	5	6	7
labor shortage	1	2	3	4	5	6	7
material shortage	1	2	3	4	5	6	7
energy shortage	1	2	3	4	5	6	7
equipment shortage	1	2	3	4	5	6	7
change in sales plan or demand	1	2	3	4	5	6	7
change in delivery due date	1	2	3	4	5	6	7
engineering design change	1	2	3	4	5	6	7
top management directive	1	2	3	4	5	6	7

4.09 What percent of the original due dates that are promised to customers are determined by each of the following? (Should add to 100%.)

the customer _____% the company _____% negotiation with the customer _____%

4.10 Approximately how many calendar days into the future has the company promised delivery?

	currently	2 years ago
minimum days to delivery promise date	_____days	_____days
maximum days to delivery promise date	_____days	_____days
usual days to delivery promise date	_____days	_____days

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

	currently	2 years ago
% of orders delivered **after** promised date	_____%	_____%

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

	currently	2 years ago
average number of days late	_____days	_____days

4.13 When finished goods are delivered late to customers, how often is each of the following the cause of lateness? (Circle a number for each factor.)

	never						very often
insufficient machine capacity	1	2	3	4	5	6	7
machine breakdown	1	2	3	4	5	6	7
material shortage	1	2	3	4	5	6	7
energy shortage	1	2	3	4	5	6	7
insufficient labor capacity	1	2	3	4	5	6	7
material quality problem	1	2	3	4	5	6	7
production quality problem	1	2	3	4	5	6	7

scheduling error	1	2	3	4	5	6	7
change of schedule priorities	1	2	3	4	5	6	7
finished goods transportation problem	1	2	3	4	5	6	7

4.14 What percent of the company's orders is completed on or before the time specified by the **production schedule**?

	currently	2 years ago
% of orders completed on time or early	_____%	_____%

4.15 What are the company's **approximate reject or return percentages** at each of the following stages? (Please provide an answer for each one.)

	currently	2 years ago
% rejects of incoming material	_____%	_____%
% rejects during processing (scrap rate)	_____%	_____%
% rejects at final inspection	_____%	_____%
% returns from the customer	_____%	_____%

4.16 About how much time typically elapses from the start of the first operation until a batch of the company's products is finished?

	currently	2 years ago
average time from start to completion	_____days	_____days

4.17 About how much time typically elapses from the reciept of a customer order until it is shipped?

	currently	2 years ago
average time from order to shipment	_____days	_____days

4.18 Using an index of 100 as the starting point 2 years ago, give the current index for the following (e.g., a 5% increase would be 105).

physical output (units, meters, etc.)	_____index
manufacturing cost (without inflation)	_____index
lobor productivity	_____index
capittal productivity	_____index

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

product design time	_____index
cost of manufacturing	_____index
manufacturing throughput time	_____index
delivery speed	_____index

5. Materials Management

Materials management includes a wide range of activities associated with purchasing, managing, distributing, and controlling inventories within the plant. Inventory includes raw materials, component parts, work in process, and finished goods. As in the other sections, we are interested in the practices employed in your plant. Since many approaches to materials management have been shown to be effective, there are no right or wrong answers.

5.01 Approximately what percent of the parts and components that comprise the company's products are fabricated within the plant?

_____% fabricated in plant

5.02 What percent of the company's purchase orders do suppliers deliver as follows? (These should sum to 100%.)

	currently	2 years ago
% delivered **early**	_____%	_____%
% delivered **on time**	_____%	_____%
% delivered **late**	_____%	_____%

5.03 What is the approximate average lateness of the purchase orders that are delivered **late**? _____days late

5.04 About how many suppliers does the company have, on average, per part? _____suppliers per part

5.05 What is the **approximate** total number of part numbers in each segment of the company's inventory system?

_____raw material part numbers

_____component part numbers

_____finished goods part numbers

5.06 How often does the company use each of the following policies when initiating purchase orders? (Circle a number for each factor.)

	never						very often
order at periodic interval (e.g., monthly)	1	2	3	4	5	6	7
order based on inventory level	1	2	3	4	5	6	7
order based on production plan or schedule	1	2	3	4	5	6	7
order based on material shortage list	1	2	3	4	5	6	7
order for actual customer order	1	2	3	4	5	6	7
order based on past experience	1	2	3	4	5	6	7
no order, supplier delivers as needed	1	2	3	4	5	6	7

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

_____total inventory value

5.08 What is the approximate distribution of the company's inventory value? (These should sum to 100%.)

% of value in purchased materials and parts _____%

% of value in work-in-process _____%

% of value in finished goods _____%

6. Summary

Thank you for your help with this survey. Your participation will contribute to a better world-wide understanding of manufacturing practices. Are there any important issues that you feel have been left out? If so, please comment in the space provided on this page.

Please let us know if there are other areas that we should consider for future study.

Comments and additional remarks:

GLOBAL MANUFACTURING RESEARCH (GMRG) SURVEY
(This page will be separated from the data.)

NAME OF COMPANY _____

EXAMPLES OF COMPANY PRODUCTS

_____

_____

_____

SIC Code (if known) _____

Please indicate, below, the name and the address of the person responsible for coordinating the completion of the GMRG survey in your company (or attach a calling card).

SURVEY COORDINATOR

Name _____

Title/Function _____

Mailing Address _____

_____

_____

_____

Phone Number _____

Fax Number _____

E-mail _____

How many years have you been with the company? _____years

How many years have you held your current position in the company? _____years

Month _____ Day _____ Year_____

For GMRG survey administrator

Administrator code _____

Country code _____

Industry code _____

Company code _____

GMRG Survey Methodology Form

(To be filled out by the researcher for each data set)

Researcher Name:_____

Country of Data:_____

1. Translation method, if applicable (describe here the procedure used to translate and verify the translation of the survey):

_____

_____

_____

_____

2. Sampling methodology (describe here how the companies were selected, how they were contacted, the process used to actually fill out the survey and the portion of firms contacted that completed the survey).

_____

_____

_____

_____

_____

_____

_____

3. Are there firms from the first two rounds of survey included in this data?_____

4. If so, did you use the same code numbers? _____

5. Is there any special meaning to the company code identification numbers you used? Describe here any special meaning that they might have (and/or how they relate to the first two rounds of the survey).

_____

_____

_____

6. Please enclose a copy of the survey you used for gathering the data.