MANUFACTURING ENGINEERING AND MATERIALS PROCESSING/5

Improving Productivity by CLASSIFICATION, CODING, AND DATA BASE STANDARDIZATION

The Key to Maximizing CAD/CAM and Group Technology

WILLIAM F. HYDE

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Improving Productivity by CLASSIFICATION, CODING, AND DATA BASE STANDARDIZATION

MANUFACTURING ENGINEERING AND MATERIALS PROCESSING

A Series of Reference Books and Textbooks

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OTHER VOLUMES IN PREPARATION

To my wife Carol

Foreword

One could say "it" all started over 30 years ago in London, England, and it is therefore fitting that someone from the United Kingdom should be asked to write the Foreword to this unusual book. I have the honor to do so for two reasons: first, it has been my privilege to know and work with Messrs. Gombinski and Hyde for so many years; and second, it has also been my privilege to have helped pioneer the use of the techniques referenced in this book.

So many designs are made, so much money wasted, so many people hurt because so-called entrepreneurs and business managers have failed all their lives to recognize one simple rule that is taught to first-line managers—*"Get the facts!"* No decision can be taken with confidence when the facts relevant to the decision are denied to the manager.

The author, like many others in the developed industrialized world, is concerned about productivity. However, he is particularly concerned about productivity in the United States! He used this concern to point the way to some of the causes of reduced productivity and some of the cures. Although he references problems experienced in America, they are not unique and are common to every country where managers must take or arrive at a decision.

Regarding other basics, he also repeats a favorite expression of mine and many others—"fear no longer motivates." The worker today is insulated and, in good measure, protected by social programs that ameliorate the fears of loss of job. In the present world, it is the job

challenge and job design which matter so very, very much. Money is not a true motivator. After basic needs have been met, money, for a variety of reasons (not the least of which is confiscatory taxation rates), fails as a motivator by itself. Job satisfaction must also be present.

In his approach to the subject matter of this book, the author goes back 100 years to Dewey, in 1876, and also to F. W. Taylor, who, in the early years of management, strongly advocated classification and coding as a means to manage the many facets of a business and to prevent waste. In my business life, I have written many memoranda headed "Management Waste." Management waste takes place to a greater degree than is realized in all industrialized countries. For example, the cost of creating a new component part for production in the United States is something on the order of $2000 each. An analysis reveals that up to 46% of what it requires to create and prepare designed parts has been found to be redundant.

Classification and coding when applied correctly has been known to show a rate of investment return of from 75% to over 400% per annum. This is not surprising when it can be shown that there are in existence 109 different names for the one same component. Designers and draftsmen believe that they are paid to design, but are they designing when they duplicate that which has been done once, twice, or even thrice before?

Much has been written about group technology, and 95% of it has been nonsense. The Russians led the way, but people in the United Kingdom and the United States rushed into something which they did not understand, but about which they wished to appear knowledgeable—because the media were writing about it. The Russians in the 1930s approached the problem out of need. They produced a realistic and pragmatic solution to their problems. They had limited financial resources coupled with low volume, long lead times, and horrendous work-in-progress investment—in short, grossly inefficient management. Thus, out of need was developed modular technological manufacturing.

That job enrichment has resulted from true group technology is because team spirit emerges. Working in a group is now becoming the "in" thing, but is this not what the Japanese have been doing for years and years, and is this the concept of GT that most American managers have?—I am afraid not, from personal observations. The development of the use of computers has greatly enhanced the value of classification

and coding as a tool of management. Savings in costs, using the computer and classification and coding together, can be astronomical. This has been my own experience. The author has made a case for managers to take an in-depth look at classification and coding of the data vital to improving the capabilities in decision making. I heartily endorse his case with three very profitable firsthand experiences.

I am sure that this book will become a standard textbook in many universities, polytechnical institutions, and colleges throughout the world and will be a valuable contribution to the practice of management.

William Jack
Bridge of Allan
Stirling, Scotland

Preface

Why a book on industrial classification, coding, standardization, and group technology and CAD/CAM? For a variety of reasons, two of the most important being

1. There is an information vacuum. Several books have been written on group technology in which classification and coding were touched upon. None have been written emphasizing the prerequisite role of classification and coding for effective group technology application. None have been written that treat the management of data as a continuing source of profit.
2. Despite, or perhaps because of, a spate of business periodical articles on these subjects, a great deal of confusion and misinformation is threatening to damage the reputation of these time-proven management tools.

Now CAD/CAM has burst upon the scene and without variety controls may well harm rather than help our economy.

For nearly 16 years, I have lectured professionally on these subjects. My colleagues and I, in addition, have addressed an endless number of meetings sponsored by our various professional societies. We have contributed many articles to the business press and to periodical publishers. We have hosted six international conferences. Finally, we have visited and presented these subjects to several hundred institutions and business firms in this country alone.

For the past several years, I have polled my audiences for their respective definitions of these subjects, especially group technology. Three out of four either admitted they didn't know or didn't know but thought they did—which is even worse.

This book is an effort to try to dispel some of the myths and misinformation spread by well-meaning but less-than-informed people. Specifically, the book attempts to

Clearly define all terms
Provide some theory
Present some practical examples

The objective is to educate managers to appreciate at least some of the "do's" and "don'ts" we have experienced as a firm. Thirty-one years have come and gone since Joseph Gombinski took an idea by Edward Brisch and made it an effective management tool to control data. Twenty years have elapsed since Gombinski and his colleagues adapted the Russian Mitrofanov's group technology for Western use in a variety of applications. It does seem time to write about it.

There are those whose contributions to this book I wish to acknowledge:

My beloved wife, Carol Whipple Hyde, for her superb editing of the text, encouragement, and great support.
Mrs. Helen Simard, for her patient effort in typing and preparing the manuscript.
William Jack, for his commentary and his testimony on how he managed better using classified and coded data and group technology.
Joseph Gombinski, who made classification, coding, and group technology into an effective management tool.
Serge A. Birn (deceased), who said: "Now that we have it [Brisch], you run it"—and left me to do it.

Many, many thanks.

William F. Hyde

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Introduction to the Data Management Problem

1.0 DATA, FACTS, AND DECISIONS

Managing is decision making, and the first commandment of decision making according to the gospel as written by Taylor, Gilbreth, et al. is: *Get the facts!*

Managers' decisions are usually made either (1) to resolve an existing problem or (2) to prevent one from developing. We can classify these kinds of decisions and code them. Class 1 decisions are tactical, and class 2 decisions, the problem preventers, are strategic. Regardless of which class of decision is to be made, facts (i.e., information that is reliable and relevant) are required.

Data are real or assumed premises that can be given as an argument or an inference. Reliable, accurate, and relevant data are facts. Sufficient available facts are the keystone for sound decision making.

Because data can be the result of inference or assumption, they are not necessarily facts. This is the real distinction between data and facts. Data are not necessarily truths; facts always are.

For example, in a recent assignment, investigation of data in a computer file for inventory control showed considerable disparity in the quantities on hand in the file versus those in the stockroom. The computer data file was not properly maintained and the integrity of the system was compromised. Data were not facts! Another example where data are not facts is the following:

The data items, in this case, are angular contact bearings. The file contained stock numbers at variance with the stockroom. An MRC5206-SBKG was shown stocked under 022-05006-00. The actual number was 002-65106-00.

Yet another example found was the same datum identified by key word for retrieval duplicated because of a different key word. This fault created 132 sets of duplicates and triplicates, and one quadruplicate. Imagine the quality of decisions on inventory levels, order quantities, usage, price structure, and the like on such unreliable data.

There was a time when management was handicapped by insufficient data. The manager collected the meager data available, analyzed the data, synthesized facts from the data, such as they were, and then made a calculated, intuitive guess.

Then came Taylor, who said that decision making without all the necessary facts was not very scientific. He said, using the example of work planning, that using time estimates based on past work performed without a record of *how* it was done was not reliable. He said that the practice of management was an art when it should be a science.

Whether you think Taylorism is dead or not is unimportant. Some of what he had to say is very relevant. Taylor's postulation was that to manage requires a capability to control. To control requires some form of factual measure. The facts of the measure must be comprised of sufficient data that can be proven by reproduction (i.e., to predict the end result). Now that is scientific, wouldn't you say?

The problem we have with data is the same today as it was then—how to distinguish fact from fiction. But today, the problem rarely involves a shortage of data. We have machinery to manipulate a vast amount of data in a very short period of time. However, to test them for integrity before accepting them as fact is just as important. Otherwise, the machinery is just helping managers make poor decisions more quickly.

Data can be tested if they can be retrieved. The real trick is to be able to make the data visible, so that we can find the relevant data when we need them. This has not been done too well in this country until recently.

Some years ago one of the major computer manufacturing firms had an advertising campaign, the thrust of which was the expression: *Not just data, but Reality!* This slogan was an inspired insight into the problems faced daily by those must make decisions. It captured the