

HANDBOOK OF INDUSTRIAL ENGINEERING

GAVRIEL SALVENDY

EDITOR



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Edited by

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FOREWORD

This *Handbook of Industrial Engineering* is being published at a very opportune time because the mission of industrial engineering is undergoing a change in magnitude and emphasis. For the past century, industrial engineering has been responsible for much of the economic progress in manufacturing. The industrial engineers have studied the way people work in our factories and the relationship of those workers to their machinery and tools. The focus has been on individuals and how to improve the effectiveness of their work.

In the future, industrial engineers will continue to study how the individual works, but much greater emphasis will be placed upon studying the systems within which the work is performed in order to optimize the operation of the total system. New technologies brought about by the computer, such as robots and automated systems, and the computerization of much of their own work, will require industrial engineers to continually restudy the application of their knowledge.

Industrial engineers in the future must greatly expand their activities beyond studying the workers in manufacturing. The percentage of the work force engaged in the production of goods passed its peak more than a decade ago, and the people working in service industries, which include hospitals, banking, insurance, post office, hotel, restaurant, armed services, government, universities, distribution, marketing, and so forth, now number twice as many as those working in manufacturing. These service workers and the systems they work in require industrial engineering techniques to improve their productivity, just as manufacturing still requires it. Industrial engineers will have to use the word "industry" in its broadest sense.

It is now recognized that productivity is a key factor in determining our standard of living, in maintaining our competitiveness in world markets, and in alleviating inflation. Industrial engineers must play a major role in improving productivity since they deal with the factors that affect it most: how people work and how they use technology. This *Handbook* deals not only with the "human use of human beings" and with the interaction between humans and machines, but with the entire system that productively makes a product or performs a service.

The chapters of the *Handbook* were written by scores of experts who, through example and theory, provide a source of ideas for improvement. The *Handbook* should be valuable to industrial engineers and other engineers, as well as to all levels of managers. The industrial engineering principles that are outlined are timeless and basic and should prove useful to corporations, both large and small,

to continuous process as well as discrete part manufacturers, and especially to those working in the service industries where most of the jobs are today.

Industrial engineering serves people and can lead all workers to improved productivity and to a higher standard of living.

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