<<自动化、生产系统与计算机集成 >

图书基本信息

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内容概要

本版对第2版的内容进行了以下修订： ◆扩展了传感器和执行元件的范围； ◆对数控技术部分的有关内容进行了顺序调整； ◆第25章“生产计划与控制”增加了企业资源规划(erp)的有关内容； ◆扩展了精益生产的范围； ◆更新了全书的习题。

作者简介

Mikell P. Groover is Professor of Industrial and Systems Engineering at Lehigh University, where he also serves as Director of the George E. Kane Manufacturing Technology Laboratory and faculty member in the Manufacturing Systems Engineering Program.He received his B.A. in Arts and Science (1961), B.S. in Mechanical Engineering (1962),M.S. in Industrial Engineering (1966), and Ph.D. (1969), all from Lehigh.

书籍目录

章节摘录

版权页：There is no denying that the long-term trend in manufacturing is toward greater use ofautomated machines to substitute for manual labor. This has been true throughout humanhistory, and there is every reason to believe the trend will continue. It has been made pos-sible by applying advances in technology to factory operations. In parallel and sometimesin conflict with this technologically driven trend are issues of economics that continue tofind reasons for employing manual labor in manufacturing operations.Certainly one of the current economic realities in the world is that there are countrieswhose average hourly wage rates are so low that most automation projects are impossibleto justify strictly on the basis of cost reduction. These countries include China, India, Russia,Mexico, and many other countries in Eastern Europe, Southeast Asia, and Central America.With the passage of the North American Free Trade Agreement （NAFTA）, the NorthAmerican continent has become one large labor pool. Within this pool, Mexico's labor rateis an order of magnitude less than that in the United States. U.S. corporate executives whomake decisions on factory locations and the outsourcing of work must reckon with thiseconomic reality.In addition to the labor cost issue, there are other reasons, ultimately based on eco-nomics, that make the use of manual labor a feasible alternative to automation. Humanspossess certain attributes that give them an advantage over machines in certain situationsand certain kinds of tasks （Table 1.1）. A number of situations can be listed in which man-ual labor is preferred over automation:Task is technologically too difficult to automate. Certain tasks are very difficult （eithertechnologically or economically） to automate. Reasons for the difficulty include（1） problems with physical access to the work location, （2） adjustments required inthe task, （3） manual dexterity requirements, and （4） demands on hand-eye coordi-nation. Manual labor is used to perform the tasks in these cases. Examples includeautomobile final assembly lines where many final trim operations are accomplishedby human workers, inspection tasks that require judgment to assess quality, or mate-rial handling tasks that involve flexible or fragile materials.Short product life cycle. If the product must be designed and introduced in a shortperiod of time to meet a near-term window of opportunity in the marketplace, or ifthe product is anticipated to be on the market for a relatively short period, then amanufacturing method designed around manual labor allows for a much fasterproduct launch than does an automated method. Tooling for manual productioncan be fabricated in much less time and at much lower cost than comparableautomation tooling.

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