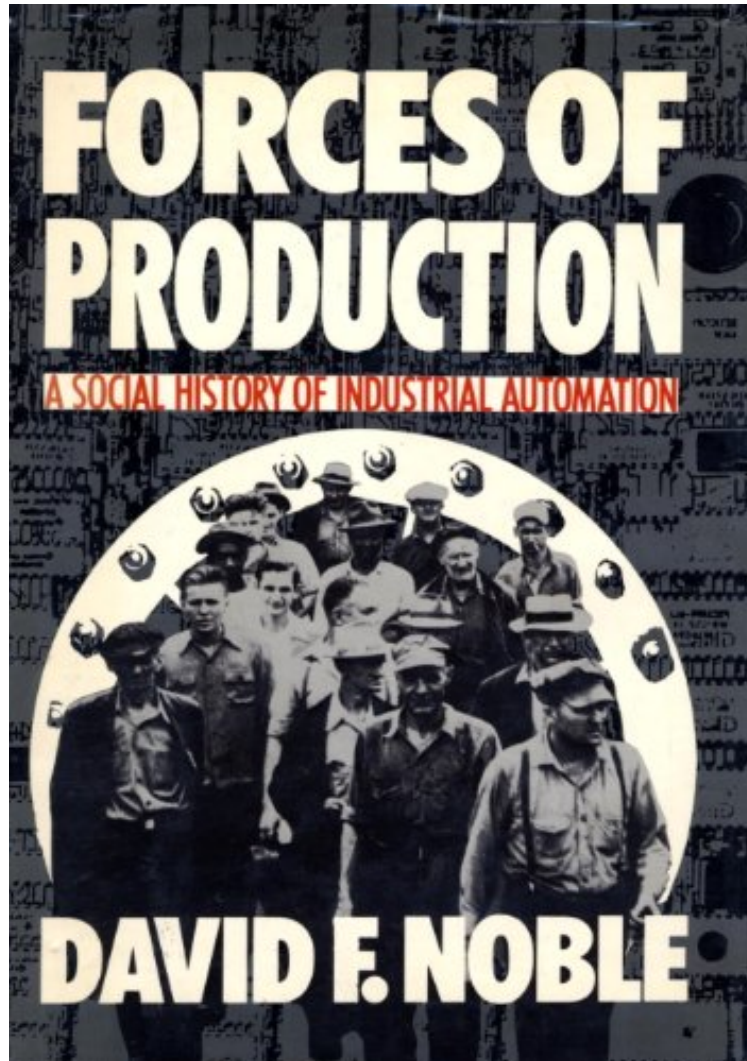


[Download] Forces of Production

Forces of Production

David F Noble

*ebooks / Download PDF / *ePub / DOC / audiobook*



DOWNLOAD



READ ONLINE

#1220488 in eBooks 2013-01-23 2013-01-23 File Name: B00CGI3H4U | File size: 27.Mb

David F Noble : Forces of Production before purchasing it in order to gauge whether or not it would be worth my time, and all praised Forces of Production:

32 of 33 people found the following review helpful. I endorse Chomsky's recommendation. By A Customer I certainly wouldn't have heard of this book if it weren't for Noam Chomsky citing it. David Noble dared to break ranks and suggest that maybe all was not right with machine tool automation. My favorite chapter, entitled "Who's running the shop" describes GE's aircraft division's "Pilot Project" in the 60's. It is first of all a damn good tale--rivaling the Arabian Nights as a never ending fascinating tale. Secondly, it is a sobering tale of labor-management relations. One suspects that GE management would rather the incident was forgotten. Here is a rough summary: The Air Force gave GE super-expensive numerically controlled (i.e. computerized) machining tools and local GE managers used these as a

weapon to deskill workers and lower their pay, but it backfired because without the good will and understanding of the workers it produced only scrap metal at a fantastic rate. The "Pilot Project" was a compromise that enabled the incompetent management to save face, and the workers and union essentially ran the shop during this time. Understandably the union and workers wanted the pilot project to go on forever, and equally understandably the higher corporate management wanted this example of worker control to end as soon as possible even though it worked extremely well.

6 of 6 people found the following review helpful. *Forces of Production* By Norman L. Bleier "Forces of Production" was published in 1984 and leaves off with NC/CNC as it was in the 1970's. By then NC (Numerical Control) had transitioned to computer circuits and software and thus, the name CNC for Computer Numerical Control. In its inception in the early 1950's it is likely that the professors and graduate students of M.I.T.'s Servo Mechanisms Laboratory named it Numerical Control because they envisioned a broader concept of social control via digital means. NC/CNC turned out not to be the path to this end; the path has been through the PC and the WWW. In view of this, I have argued that the technology should be called NDI for numerically directed interpolation because this is what it does. It directs a cutting tool to interpolate a path in the work envelope of the machine. The book could have done better in defining interpolation - you did interpolation in kindergarten when you connected the dots in sequential order with straight lines to reveal a figure. It could have done better in explaining how Cartesian (geometric) information is processed into setpoints to position servos to cause the tool to interpolate a path in the work envelope of the machine. This explanation is central to understanding the difference between John Parson's by-the-numbers positioning concept and the much more sophisticated interpolation technology developed by M.I.T. Our most current CNC is provisioned with spline algorithms that interpolate a curve from Cartesian points. The algorithms render curves as sequences of piecewise continuous parametric polynomials and these polynomials are sampled on a time grid to issue setpoints to position servos. This sampling of a function - called the interpolant - is what most CNC workers mean when they point to the CNC and say, "That thing interpolates." The ability of contemporary CNC to sample polynomial interpolants is what enables commercially affordable CNC to keep up with data requirements of servo platforms that are 20 times more dynamic than when *Forces of Production* was first published. As I have already said, "Forces of Production" leaves off with NC/CNC as it was in the late 1970's when the U.S. machine tool industry was on the threshold of collapse and the center of CNC development was emerging in Japan with its emphasis on reliability, friendliness and standard machines ready for immediate delivery to U.S. job shops. Today the leading CNC development is in Germany. The world market for vender CNC - CNC produced to be sold to machine tool builders - is an oligopoly of two, Siemens of Germany and Fanuc of Japan. Siemens dominates in large, high-end and special machines; Fanuc in simpler mid to low-end machines. These are fluid boundaries. High end and special machines can be done with Fanuc, just not as elegantly as with Siemens, and in recent years, Siemens has made a determined push into the low end. With regards to contemporary CNC and "class struggle", we have "teach" CNC with strong elements of record/playback, we have symbolic programming (conversation programming) in which machining operations are programmed by the operator at the machine, we have the traditional tool path Cartesian programming with CAD/CAM/CNC where the programmer works in an acoustically isolated, air conditioned front office and the operator is at the machine. However, even with CAD/CAM/CNC, the CNC is provisioned with a powerful HMI (Human/Machine Interface) that allows the operator to assert his will on the machining process for him to establish a rapport with the workpiece. How much decision making is left to the operator is a continuum between all and none that is worked out between the operator and the programmer. The massive functionality of contemporary CNC - sometimes referred to as "Open System CNC" - allows an operator or programmer with an engineer mindset to produce software (cycles and asynchronous subroutines) to so finely tailor the machine to the shop's processes that over time the operator of a given machine is less and less burdened with decisions that can be done with automation. The significance of this is that the development is at the user level, and given that documentation is available on line, a smart operator can make a profound difference in developing the productivity of his CNC machine and usually under the radar of management. "Class struggle" is still active and I suspect that Dr. Nobel, were he still with us, would find most interesting the developments from roughly the mid 1990's that address global, multinational production. This includes such CNC features as b-spline algorithms that unite CNC with the geometry of CAD, real time kinematics transformations for 5-axis aerospace machining (and not just aerospace), kinematics independent specification of orientation (orientation with unit vectors), relational tool data bases in which tool name/number and its geometry is synchronized as a property of the machine, world wide tool management, HMI in all the world's major languages and e-services for monitor, diagnose and repair, to mention just a few. Boeing flew with some of these developments (to some degree) and their experience with the Dreamliner would be a fascinating volume II to the work that Dr. Nobel began.

2 of 2 people found the following review helpful. *The Evolution of Technology - a Marxist View* By Kevin Lindsey It's a testament to David Noble's writing ability that he's crafted such a fascinating book from the topic of industrial automation. "Forces of Production" makes a solid case against the traditional view of high technology as driven by Darwinian market or technological forces. Instead, he documents the pivotal roles that political, military, psychological, sociological, and institutional powers may sometimes play in driving machine development in irrational directions. In this respect, the battle between numerically-controlled versus record-playback machines was

extraordinarily well documented and persuasively told. If I had any issue with this book, it would be over Noble's Marxist bias and the subsequent possibility that he has over-emphasized the role that management control played in machine evolution. Per Noble, a key driver for the development of computer-controlled automation lay in corporate management's desire to break the power of the labor unions or, in the dream of completely automated factories, do away with labor altogether. He certainly makes a compelling case but, thirty years and a computer revolution after this book was published, many of the management decisions he criticizes now seem fairly prescient. This is a must-read for anyone interested in the development of technology or in the sociology of our military-industrial-academic complex. Five stars.

Focusing on the design and implementation of an important new production technology—computer-based automatic machine tools—David F. Noble challenges the idea that technology has a life of its own which proceeds along a singular path. Such as seen, technology has been both a convenient scapegoat and a universal panacea, serving to disarm critics, divert attention, depoliticize debate, and dismiss discussion of the fundamental antagonisms and inequalities that continue to beset America. This provocative study of the postwar automation of the American metal-working industry—the heart of a modern industrial economy—explains how dominant institutions like the great corporations, the universities, and the military, along with the ideology of modern engineering, actually shape the development of technology itself. Noble shows how the system of “numerical control,” perfected at MIT and put into general industrial use, was chosen over competing systems for reasons other than the technical and economic superiority typically advanced by its promoters. Numerical control took shape at an MIT laboratory rather than in a manufacturing setting, and a market for the new technology was created, not by cost-minded professors, but instead by the U.S. Air Force. Meanwhile, competing methods, equally promising, were rejected because, among other reasons, they left control of production in the hands of the skilled workers, rather than in those of management or programmers. Thus, Noble demonstrates, engineering design is influenced by political, economic managerial, and sociological considerations, while the deployment of equipment—illustrated by a detailed case history of a large General Electric plant in Massachusetts—can become entangled with such matters as labor classification, shop organization, managerial responsibility, and patterns of authority. In its examination of technology as a human, social process, *Forces of Production* is a pathbreaking contribution to the understanding of this phenomenon in American society.

"Noble's research is exhaustive, his technical descriptions are full and understandable, and his writing is lively.... This book will be a classic in the field." --American Historical "A prodigious accomplishment." --The New York of Books "Rich and absorbing.... It is truly a definitive work and will doubtless serve to redirect research in the field." -- s in American History "[Provides] superbly researched, in-depth data.... This story is fascinating and well told." --The New York Times Book "Pioneering work on a major development in late 20th-century history." --Lawrence B. de Graef, California State University, Fullerton From the Back Cover 'A prodigious accomplishment. Through the depth of his research and the care of his narration, Noble has produced a detailed, gripping, and convincing work of social history, which adds detail, sinew, and emotion to our understanding of issues that are usually considered only in the abstract.' About the Author David F. Noble is at Drexel University.