Ioannou, Petros A. Intelligent Freight Transportation. *Automation and Control Engineering, Vol. 27. Boca Raton, FL, and London: CRC Press, 2008. ISBN 9780849308772. 344 pp.*

Intelligent Freight Transportation

by Kevin Horn

Intelligent Freight Transportation (IFT) is a collection of 17 readings dealing with containerized freight movements involving sea ports and landside accesses. There is substantial breadth of topics covered, ranging from automation at sea ports to the development of inland terminals. The best way to address the breadth of the port topics covered is to cite the titles of the articles, which should speak for themselves: (1) Introduction of Intelligent Freight Transportation, (2) Automated Container Terminal Concepts, (3) Automated Container Terminals: Lessons Learned for Future Successes, (4) Operational Issues in Modern Container Terminals, (5) Models for Cross-Border Land Transportation, (6) Container Port Choice and Container Port Performance Criteria: A Case Study on the Ceres Paragon Terminal in Amsterdam, (7) Inland Ports; (8) Inland Terminal Concepts, (9)Maglev Freight Conveyor Systems, (10) Container Movements with Time Windows, (11) Intermodal Drayage Routing and Scheduling, (12) Crane Double Cycling in Container Ports, (13) Empty Container Reuse, (14) Port Labor: The Effects of Competition, Devolution, Labor Reform, Trade and Technology, (15) Intelligent Freight Technologies: A Longshore Perspective, (16) Environmental Management of the Logistics Chain: Concepts and Perspectives, and (17) Green Ports and Green Ships.

The diverse collection of articles presented addresses aspects of most of the issues affecting throughput for very large container ports. The purpose of the book is stated as "to bring together a number of experts working in different areas or disciplines to present some of their latest approaches and future research directions in the area of IFT." The author correctly opines that "the field is so diverse that it is impossible for the 17 chapters of the book to cover every single aspect of the area."

The major contribution of the book is stated to be: "The complexity of the problems involved, the issues raised, and proposed solutions will give the reader a clearer picture of the complexity of the problem as well as provide knowledge of the areas where progress could be made." This is the test by which the reader will judge the merits of the compendium of different articles.

Most of the articles stem from the early part of the decade when sponsored research into maritme port-related systems was centered at university-sponsored research centers such as CCDoTT (Center for the Commercial Deployment of Transportation Technologies) at California State University at Long Beach that engaged in the "Agile Ports and Terminal Systems," "High-Speed Ships, Rapid Deployment," and "Command and Control" research programs. CCDoTT funding allowed for a network of other research institutions, including universities (I was associated with one, where I participated in the CCDoTT program), to participate in technological systems applications to port issues, notably complex capital and labor productivity issues attending large marine container terminals.

With this background, the book emerges as an outgrowth of the sponsored research push at the close of the last decade to make large container ports more efficient (or at least demonstrate the inefficiencies embedded therein). The problems with these ports (reflecting large publicly owned and subsidized marine infrastructure, heavily unionized workforces, and spiraling volumes of containers with ever-increasing vessel sizes that necessitate primarily truck movements between the port and congested adjacent land-side infrastructure) were envisioned as susceptible to IFS

(intelligent freight systems). Thus the book addresses the major problems, including labor, afflicting mega container ports from the perspective of "intelligent" applications.

Each article in the book stands on its own from the perspective of contributing to the efficiency of mega container ports. Some of the articles are more practical and useful than others. The early articles pertaining to automated container terminals strike at the heart of U.S. container ports which are both capital and labor intensive. Because the capital and labor inputs are supplied by different players, there is often no mechanism to make efficient trade-offs. Consequently, automation sometimes seems the best or perhaps the only viable course of action given the notable and prevalent examples outside the United States in Europe and Asia. When you automate and presumably virtually eliminate demand (as opposed to supply) for labor you would expect to correspondingly eliminate labor problems, or so the thinking goes! But this has not been the experience of U.S. container ports with relatively limited applications of automation (something not well addressed in this IFS textual framework).

Despite the obvious substitution of capital for labor and the frustrations encountered in U.S. marine container terminals implementing these efficiencies (the two chapters on labor do not address the reality of the political complexities that characterize local and regional port labor monopolies pitted against steamship owner representatives against the background of public ports), generally there are no readily implementable institutional alternatives to the status quo between labor and capital. The West Coast port shutdown in the early part of the last decade illustrated this predicament and the incentive to push harder on the technology envelope to substitute technology for institutions. One article succinctly reminds the reader that "an adage appropriate to the CCDoTT paradigm shift, attributed to Einstein, is, 'you cannot solve problems with the same technologies that caused them.'" Yet, the same longshoreman who buys groceries at a self-scanning check-out lane refused to use the technology for container movements at the port!

There is a chapter on "Maglev Freight Systems" that emanates from the CCDoTT agile port concept. The material is decidedly futuristic, including order-of-magnitude "costs" for capital and operations that might suggest such systems could be a reality. It is reminiscent of the New York Central Railroad "Flexivan" depictions from the 1960s of a maglev form of container movements by rail.

Articles with more practical insights into the logistical issues of mega container ports include "Operational Issues in Modern Container Terminals," "Intermodal Drayage Routing and Scheduling," and "Empty Container Reuse." Each piece identifies the myriad issues and details required to understand the problems and perhaps address them in an analytical manner that is better than the rules of thumb by practitioners.

The book is well organized, flowing from an introduction to the automation of terminals, then inland terminals as adjuncts to marine seaport terminals, followed by pieces related to container movement logistics. Two sections on port labor are then followed with environmental issues related to marine container terminals and vessels.

The articles represent works likely published elsewhere (certainly some appeared to be distinctly similar to materials I had reviewed for JTRF submissions as the editor of ports and marine manuscripts) or summaries of other published works such as research manuscripts. The works are well edited, such that preceding each article are very clearly stated objectives and a topical description that tells the reader what to expect in the pages to follow. Accordingly, the book can be used as a menu for the reader to peruse the introductions of the different articles and make selections based on objectives.

There is a clear tendency towards modeling and systems approaches in dealing with IFS. Most of the nomenclature and expressions are well explicated so the non-technical reader can assimilate the gist of what is being presented.

The collection of writings from the early part of the last decade is indicative of the progress or lack thereof, depending on one's perspective, in applying automation and systems to solving the capital and labor productivity issues of mega container ports in the United States. There is a

continental flavoring of materials pertinent to outside of the United States. that is not necessarily easily transposable to the United States. The reader is left to decide whether mega container ports outside the United States. are really more efficient or just different agglomerations of capital, labor, and institutions. Automation and IFS as presented in this book do not treat these important issues except in a peripheral manner.

The book is an interesting collection of writings that are descriptive of the ongoing problems facing U.S. mega container ports. There is a definitive academic orientation to the material that will well serve students who want an overview of marine container terminal productivity issues. This is a good readings book for a graduate-student-level seminar or topical readings for undergraduates. As a point of entry, the book serves in turn as a point of departure to deeper inquisition and understanding.

Kevin Horn *is senior consultant at G.E.C., Inc., in Delaplane, Virginia. He was previously a research professor at the National Ports and Waterways Institute, University of New Orleans, Arlington, Virginia. His research interests are in transportation and logistics systems performance measurements. He served on the editorial board of* JTRF*, at one time as co-general editor, as well as* Transport Reviews *(North American Editorial Team). He holds B.S. and M.B.A. degrees from Indiana University and a Ph.D. from Penn State.*