

Preface

Manufacturing is the soul of a region's economy. In an increasingly 'flat' world, manufacturing organizations across the world are faced with a diverse range of challenges that are different for each region of our globe. For example, U.S. and European manufacturers are battling high labor costs, an aging workforce and governments without pro-active manufacturing strategies. Manufacturers in China are faced with high inflation and a strengthening currency. Their counterparts in India have the challenge of establishing their global credibility in terms of reliability and quality. In Latin America, manufacturing has traditionally flown 'under the radar' except in Brazil.

Today's 'flat' world has allowed organizations in the different emerging regions of the world to communicate in a more streamlined fashion. It has also allowed different organization to integrate. Consider the new Boeing 787 Dreamliner. This long awaited airplane also happens to be the most technologically advanced is made mostly of composites and promises to transform the future of aviation. Equally notably, it has already changed aviation manufacturing paradigms. For example, the company has outsourced 70% of the production of the Dreamliner to 50 different manufacturers (or partners across 135 sites in four different continents. For example, the wings are made in Japan, the wing tips in Korea, the Horizontal Stabilizer in Italy, the landing gear in the U.K, the cargo doors in Sweden, the rudder from China and the fairing in Canada. According to Scott Strode, a Vice President at Boeing, "the 787 not only will revolutionize air travels, it represents a new way of building airplanes". Just as importantly, the design and production database utilized (made by Dassault, France) allows these geographically distributed sites to be continuously linked so everyone works from the same set of drawings. The Boeing 787 Dreamliner production strategy points to the need not only for globally competitive manufacturing facilities, but also on robust supply chains that can (and may need) to bypass traditional infrastructural channels. For example, Boeing redesigned a few 747s into Dreamlifters that fly the components into the final assembly plants in Washington State and South Carolina.

The need for a robust production and supply chain strategy is highlighted by the fact that despite their close attention to detail, executives attribute the long and

embarrassing delays in the production of the Dreamliner to the number of suppliers and the supply chain. The story of the Boeing 787 has received much press and media attention. In fact, most media reports and archival case studies in manufacturing focus on high profile, multi-billion dollar companies.

However, the fact remains that the bulk of manufacturing done world-wide is at small and medium sized companies. These companies, who have traditionally confined their footprint to national or regional boundaries are now facing global challenges, both in terms of competitiveness from their counterparts in geographically dispersed regions across the globe and also cost pressures.

This book consists of carefully chosen chapters and drawn from papers presented at the International Conference of Production Research Americas Region held in Bogota in July 2011. The conference papers have been expanded to document relevant archival knowledge and specifically address the needs of these enterprises described above. The book is divided into four sections. The first section focuses on the different dimensions of operations management. It consists of three papers describing challenges faced by companies in Spain, Turkey and Colombia. The second section details the different aspects of planning for robust supply chains and logistics. While papers in this section are developed from challenges faced by Colombia organizations, the specific solution methodologies advocated can be extrapolated and implemented globally. For example, Colombia is one of the world's largest exporters of flowers. While flowers are beautiful and a simple expression of joy, the challenges faced in their handling and distribution are complex since they are fragile and have a short shelf life. Four diverse environments are detailed here – flower distribution, patient transfers between facilities, pedestrian interactions in an intersection and finally, an emergency call center. The third section is more specific in addressing challenges of Production Planning and Scheduling. The strength of this book is the diversity of environments that it represents and in this section too, multiple environments are addressed including manufacturing, vehicle routing, a cash supply chain, and lastly, embedded systems. Finally the last section details three case studies including the pharmaceutical industry, industry-university interactions in low technology based organizations and finally a traditional machine shop that has successfully dealt with layout challenges utilizing lean manufacturing principles.

This book will fill a gap in archived knowledge and help small and medium sized organizations face the multiple global challenges that are thrust upon them. I would like to congratulate the editors and the authors in developing this important publication.

Sincerely

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