

Preface

Globalization, unpredictable markets, increased product customization and the quest for competitive advantages are but a few of the many challenges facing manufacturing enterprises now and in the foreseeable future. Frequent changes in product, production technologies and manufacturing systems are evident today along with their significant implementation costs. Increased competitiveness requires enhanced quality and value through increasingly innovative products, materials and production technologies. One key strategy for manufacturing success and economic sustainability is to satisfy the market demand for increased product variants while reducing the resulting variations in their manufacturing and associated cost and complexity. This trend is on the rise as evidenced by the paradigm shifts witnessed in manufacturing systems and their increased flexibility and responsiveness to cope with the evolution of both products and manufacturing systems.

A host of external and internal change drivers exist that affect manufacturing enterprises at various levels from strategic planning for re-positioning the business, to tactical control of production plans and facilities to achieve a high degree of responsiveness. The changing manufacturing environment requires careful effort to prolong the life of manufacturing systems by making them easily adaptable and facilitating the integration of new technologies and new functions. This requires pre-designing effective paths for change and providing innovative change enablers and adaptation mechanisms.

The availability of solutions that go beyond adaptability and flexibility will thus be crucial for enhancing productivity and ensuring competitiveness and economic sustainability in the manufacturing sector.

The theme of the 4th International Conference on Changeable, Agile, Reconfigurable and Virtual production (CARV2011) is “Enabling Manufacturing Competitiveness and Economic Sustainability.” The leading edge research and best implementation practices and experiences, which address these important issues and challenges, presented in the CARV2011 conference are included in this book. It is organized in 5 Parts and contains 107 papers contributed by 242 authors from around the world. The topics cover leading edge advances in manufacturing systems design, planning, evaluation, control and evolving paradigms such as mass customization, personalization, changeability, reconfigurability and flexibility. It treats new and important concepts such as the dynamic product families and platforms, and co-evolution of products and systems, and methods for enhancing manufacturing systems’ economic sustainability and prolonging their life for use to produce more than one product generation. Enablers of change in manufacturing systems, production volume and capability scalability and managing the volatility of markets, competition among global enterprises and the increasing complexity of products, manufacturing systems and management strategies are discussed. An outline of industry challenges and future directions for research and development needed to help both practitioners and academicians are presented.

Professor Hoda A. ElMaraghy, PhD, PEng, FCIRP, FSME, FCSME

Canada Research Chair (CRC) in Manufacturing Systems

Chair, CARV2011 Conference

Enabling Manufacturing Competitiveness and Economic Sustainability

Proceedings of the 4th International Conference on Changeable, Agile, Reconfigurable and Virtual production (CARV2011), Montreal, Canada, 2-5 October 2011

ElMaraghy, H. (Ed.)

2012, XII, 665 p., Hardcover

ISBN: 978-3-642-23859-8