Editorial

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Increasing opportunities in international markets have led to significant new competitive pressures on industry. Recently, these pressures have brought about changes to organisational structures at the level of product design and have altered the philosophies of computer-integrated manufacturing and concurrent engineering. Changes in industry structures are now occurring as companies build worldwide manufacturing relationships. Consideration of these issues leads to a recognition that an integration of design and manufacturing needs to be made to ensure business competitiveness. If such integration succeeds, the product life cycle will decrease, leading to lower manufacturing costs. To achieve the integration of design and manufacturing, it is vital to understand how manufacturing information can be obtained directly from the Computer Aided Design (CAD) system. CAD and Computer Aided Manufacturing (CAM) systems are based on modelling geometric data. The usefulness of CAD/CAM systems lies in the ability to visualise product design, support design analysis, and link to generation of part programmers for manufacturing.

The purpose of this special issue, entitled *Computer-Based Design and Manufacturing*, is to promote and disseminate research that deals with managing the integration problem in both the design and manufacturing domains. It offers researchers and practitioners the most recent concepts, methodologies, and techniques in the fields of design and manufacturing.

In the first paper, Kamrani and Nasr present an integrated framework for product design and development in a distributed and collaborative environment. The proposed system emphasises the integration of the software tools and the resources involved in the design process to enable collaboration among geographically dispersed design teams and vendors. A case study for design of gear is presented. In the second paper, by Garbie, Parsaei and Leep, a novel type of model is developed to measure the agility level of the manufacturing firms, based on existing technologies, users' level of qualification, manufacturing strategies, management systems, and the business process. This paper includes a comprehensive case study to illustrate the application of the methodology implemented. To minimise polymer and energy wastes in the SIS prototyping process, a new adjustable heater system is designed, developed, and presented in the third paper of this special issue by Asiabanpour, Subbareddy, Kolichala, and van Wagner. Within this heater, many small heat elements are installed in the form of an array. An interface computer

program maps each slice of the part CAD model over the heater image. Then each heat element, depending on its overlap with the sliced model, is turned ON or OFF. This enables the elements to sinter the polymer powder solely in the desired areas. In their paper, Abdi and Repolles present a case study in the integration of manufacturing strategy and process validation based on an Analytical Hierarchy Process (AHP) model. In the next paper, Feng has proposed an integrated approach for parameter design and tolerance design to find the optimal settings of nominal values and tolerance levels for a system with multiple criteria. This proposed method attempts to reduce the cost associated with the product life cycle and manufacturing costs. Parikh, Zeid, Kamarthi, and Benneyan address the topic of RFID in their paper. In this paper, the authors simulate the communication flow between tags and their reader to investigate how the acceptable reading time is influenced by the size of tag population, data frame length, mean thinking time, and the statistical distribution of thinking time. The analysis indicates that the acceptable reading time is affected in different ways by different factors. Finally, Kamrani and Adat have developed a simulation-based methodology and supporting tool for the measure of manufacturing complexity. The study is focused on the cost of inventory and its impact due to the addition of a new product variety.

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