Preface

Process design is at the heart of all activity, it enables the manufacture of complex products like aircraft to something as simple as preparing a meal at home. This has led to the development of methodologies that aim to capture and formalise process knowledge. For the area of manufacturing process design variant and generative types of methodologies have emerged but the ability to apply process knowledge in an interactive and intuitive manner remains elusive. Those familiar with manufacturing therefore propose a heuristic approach, which is defined as a method of obtaining solutions via exploring possibilities rather than applying sets of rules or algorithms to solve a specific problem. A research project was undertaken to scope this possibility and what emerged from the effort was software that proved to be of value to industry and for teaching in universities, it is outlined here in detail.

Chapter 1 provides a perspective of product and process design illustrating the main steps involved. Chapter 2 examines the practice and procedures available and highlights the need for a heuristic approach. Chapter 3 details a new concept for process design based on the parsing of process narrative to separate the key variables involved and to determine their inter-relationships. The concept was engineered into a data schema that unifies part manufacture and assembly planning, hence creating new possibilities for costing and process knowledge management. Chapter 4 demonstrates the methodology through a manufacturing example and shows how it can be utilised for integrated manufacturing process design and costing. Chapters 5 and 6 provide tutorials for students and Chap. 7 focuses on industrial case studies. For further details visit the website http://www.simsoftks.com.

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