Closed-Loop Product Life Cycle Management — Using Smart Embedded Systems

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Preface

Developing a "Closed-Loop Product Life Cycle Management (PLM) using Smart Embedded Systems" was the challenging mission for the IMS Project PROMISE (Product Life Cycle Management and Information Tracking using Smart Embedded Systems), which successfully concluded in 2008.

PROMISE developed a new type of closed-loop PLM based on product embedded Information Devices (PEID), which allows product information to be tracked at all times and in any location around the world. This new PLM system enables product users, maintainers, and manufacturers to manage the life cycle information of their products seamlessly over all life cycle phases: beginning of life (BOL), middle of life (MOL), and end of life (EOL).

Over the next five chapters, this book will provide industrial users as well as the broad R&D community with an understanding of the principles behind the PROMISE technologies, their successful implementation in the PROMISE demonstrators, and their enormous potential across the industrial spectrum:

Chapter 1. Introduction with overview on the IMS PROMISE project
Chapter 2. Description of the PROMISE 'Closed-Loop PLM' approach
Chapter 3. Explanation of principles and achievements for the main PROMISE technologies
Chapter 4. Presentation of approach and results for various successfully developed demonstrators in different industrial areas
Chapter 5. Highlights on benefits using PROMISE technologies and its applicability for broad industrial fields

The material for this book is taken from the PROMISE work and deliverables with contribution from all project partners.

Acknowledgments

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I would like to send special thanks to the various authors of the chapters in this book for their great efforts, as well as to the Regional Coordinating Partners for always keeping this large interregional project team on a successful track, and last—but not least—to all project partners for their collaboration and their contributions to this project.

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Introduction

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The main objectives

The manufacturing sector has driven research and the implementation of new technology for decades. It is in a special position, providing end-user products for households, capital intensive products for national infrastructures and production facilities and machine tools for other industries. Its products are often highly complex, involving supply chains in several tiers.

Manufacturers employ advanced technology in both their products and their manufacturing processes. Products are frequently mechanical with embedded electronics and manufacturing equipment is often computer controlled.

But manufacturing is not simply a technological matter. It also has a substantial managerial component connected to planning, scheduling, logistics, quality assurance, as well as providing maintenance and service at individual plants and across supply chains. Lately, recycling has been added to the list.

Parts and product identification has always been important and it is essential for competitive products in today's market. Product classification systems were developed to control product variants early on. The bill of material at the top level could be extracted from the product identifier, which helped immensely in the development of cost-effective logistics, maintenance, and service. Classification codes were later developed for individual parts. This was necessary for au-