

Contents

Part I Introduction

The Semantic Product Memory: An Interactive Black Box for Smart Objects	3
Wolfgang Wahlster	
SEMPROM—Dissemination and Impact	23
Anselm Blocher	
Towards an Integrated Framework for Semantic Product Memories . . .	39
Gerd Herzog and Alexander Kröner	

Part II Platforms for Building a Digital Product Memory

Hardware Requirements for Digital Product Memories	59
Jörg Neidig	
The Smart SEMPROM	73
Jörg Neidig, Thomas Grosch, and Ulrike Heim	
A Robotic Platform for Building and Exploiting Digital Product Memories	91
Johannes Lemburg, Dennis Mronga, Achint Aggarwal, José de Gea Fernández, Marc Ronthaler, and Frank Kirchner	
Capturing Sensor Data in the SEMPROM Automotive Scenario	107
Young-Jae Cho and Jörg Preißinger	

Part III Modeling and Processing Digital Product Memories

The SEMPROM Data Format	127
Sven Horn, Alexander Claus, Jörg Neidig, Bruno Kiesel, Thorbjørn Hansen, and Jens Hauptert	

DPM Mapper: A Concept to Bridge the Gap Between XML-Based Digital Product Memories and Their Binary Representation 149
Marc Seißler, Peter Stephan, Jochen Schlick, and Ines Dahmann

A Digital Product Memory Architecture for Cars 163
Young-Jae Cho, Florian Kuttig, Markus Strassberger, and Jörg Preißinger

The Object Memory Server for Semantic Product Memories 175
Jens Hauptert and Michael Schneider

The Block Interface: Accessing Digital Product Memories 191
Bruno Kiesel and Jörg Neidig

Distributed Digital Product Memories 205
Sven Horn, Barbara Schennerlein, Anne Pförtner, and Thorbjørn Hansen

Part IV Multimodal Interaction with the Digital Product Memory

Supporting Interaction with Digital Product Memories 223
Alexander Kröner, Jens Hauptert, José de Gea Fernández, Rainer Steffen, Christian Kleegrewe, and Martin Schneider

Controlling Interaction with Digital Product Memories 243
Patrick Gebhard

Interaction Modalities for Digital Product Memories 261
Michael Schmitz, Boris Brandherm, Jörg Neidig, Stefanie Schachtl, and Matthias Schuster

Part V Applications of Digital Product Memories

Applying Digital Product Memories in Industrial Production 283
Peter Stephan, Markus Eich, Jörg Neidig, Martin Rosjat, and Roberto Hengst

Using Basic RFID-Based Digital Product Memories for Protection against Counterfeit Goods in Manufacturing Plants 305
Jörg Neidig

A SEMPROM Use Case: Tracking & Tracing for Green Logistics and Integrity Control 311
Markus Kückelhaus, Carsten Magerkurth, and Jörg Baus

Enhancement of Consumer Support in Retail Scenarios by Utilization of Semantic Product Memories 329
Gerrit Kahl, Carsten Magerkurth, Jörg Preißinger, Patrick Gebhard, and Benjamin Weyl

A SEMPROM Use Case: Health Care and Compliance 349
Boris Brandherm, Michael Schmitz, Robert Neßelrath, and Frank Lehmann

A SEMPROM Use Case: Maintenance of Factory and Automotive Components 363
Jörg Neidig and Jörg Preißinger

A Summary of End-User Feedback on Digital Product Memories 381
Gerrit Meixner, Alexander Kröner, and Gerrit Kahl