

Cambridge University Press

978-0-521-19519-5 - Smart Products, Smarter Services: Strategies for Embedded Control

Mary J. Cronin

Frontmatter

[More information](#)

Smart Products, Smarter Services

We are surrounded by products that have minds of their own. Computing power, in the form of microcontrollers, microprocessors, sensors, and data-storage chips, has become so cheap that manufacturers are building connectivity and embedded intelligence into all types of consumer goods. These “smart products” are fundamentally changing both the competitive landscape for business and the daily lives of consumers. This book analyzes the evolution of smart products to help managers understand the impact of embedded product intelligence on corporate strategy, consumer value, and industry competition. It describes four different ecosystem strategies for designing and launching smart products: the control-focused *Hegemon*, the standards-focused *Federator*, the high-growth and brand-focused *Charismatic Leader*, and the disruptive industry *Transformer*. This ecosystem model is then applied to smart products in the automotive, wireless, energy, residential, and health industries. The book concludes with recommendations for successfully managing smart products and services.

MARY J. CRONIN is Professor of Management in the Information Systems Department at the Carroll School of Management, Boston College. Her research analyzes the intersection of business strategy and technology, with a focus on industry transformation from technology triggers such as the Internet, wireless networking, and embedded product intelligence. She is the author of numerous books, including *Doing Business on the Internet* (1994) and *Unchained Value* (1999).

Cambridge University Press

978-0-521-19519-5 - Smart Products, Smarter Services: Strategies for Embedded Control

Mary J. Cronin

Frontmatter

[More information](#)

Smart Products, Smarter Services

Strategies for Embedded Control

MARY J. CRONIN



CAMBRIDGE
UNIVERSITY PRESS

Cambridge University Press

978-0-521-19519-5 - Smart Products, Smarter Services: Strategies for Embedded Control
Mary J. Cronin

Frontmatter

[More information](#)

CAMBRIDGE UNIVERSITY PRESS

Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore,
São Paulo, Delhi, Dubai, Tokyo, Mexico City

Cambridge University Press

The Edinburgh Building, Cambridge CB2 8RU, UK

Published in the United States of America by Cambridge University Press,
New York

www.cambridge.org

Information on this title: www.cambridge.org/9780521147507

© Mary J. Cronin 2010

This publication is in copyright. Subject to statutory exception
and to the provisions of relevant collective licensing agreements,
no reproduction of any part may take place without the written
permission of Cambridge University Press.

First published 2010

Printed in the United Kingdom at the University Press, Cambridge

A catalogue record for this publication is available from the British Library

Library of Congress Cataloguing in Publication data

Cronin, Mary J.

Smart products, smarter services : strategies for embedded control /

Mary J. Cronin.

p. cm.

Includes bibliographical references and index.

ISBN 978-0-521-19519-5 (hardback) – ISBN 978-0-521-14750-7 (pbk.)

1. Embedded computer systems. 2. Computer storage devices.

3. Consumer goods. 4. Electronic commerce. I. Title.

TK7895.E42C76 2010

004.16–dc22

2010024609

ISBN 978-0-521-19519-5 Hardback

ISBN 978-0-521-14750-7 Paperback

Cambridge University Press has no responsibility for the persistence or
accuracy of URLs for external or third-party Internet websites referred to in
this publication, and does not guarantee that any content on such websites is,
or will remain, accurate or appropriate.

Cambridge University Press

978-0-521-19519-5 - Smart Products, Smarter Services: Strategies for Embedded Control

Mary J. Cronin

Frontmatter

[More information](#)

To Scott: my best chum and partner in all things

Contents

<i>List of figures</i>	<i>page</i> viii
<i>List of tables</i>	ix
<i>Acknowledgments</i>	x
1 Evolution of embedded intelligence	1
2 Smart product ecosystems	34
3 Embedded product controls	70
4 Intelligent automobiles	103
5 Smartphones and wireless services	135
6 Energy: imbalance of power	169
7 Smart home vision and reality	201
8 Connected machines and consumer value	233
9 Smart product privacy issues	262
10 Strategies for managing smart products and services	295
<i>References</i>	316
<i>Index</i>	328

Cambridge University Press

978-0-521-19519-5 - Smart Products, Smarter Services: Strategies for Embedded Control

Mary J. Cronin

Frontmatter

[More information](#)

Figures

2.1	Primary smart ecosystem dimensions	<i>page 39</i>
2.2	Smart ecosystem model framework	45
10.1	Availability of Federated platforms for smart products	297
10.2	An information-hoarding smart product platform	308
10.3	A transparent information smart product platform	309

Cambridge University Press

978-0-521-19519-5 - Smart Products, Smarter Services: Strategies for Embedded Control

Mary J. Cronin

Frontmatter

[More information](#)

Tables

3.1	Smart product modes of control	<i>page 74</i>
3.2	Selected patents covering Nestlé's Nespresso machine and its capsules	87
8.1	High-value features for enterprise M2M smart services	244
8.2	High-value features for consumer smart services	249

Acknowledgments

Writing about emerging technologies and rapidly evolving industry trends in fields populated with numerous business models and relatively few success stories is a daunting task. I am deeply grateful to Paula Parish and Cambridge University Press for agreeing that the impact of embedded product intelligence on corporate strategies and individual product owners is worthy of book-length analysis. I especially appreciate Paula Parish's guidance and that of early readers and reviewers in shaping the topic to focus on business strategy and social impact rather than on the ever-shifting technical options for smart product implementation and connectivity.

As with any multi-year project, it is literally impossible to acknowledge the many experts and organizations that informed my thinking and enhanced my understanding of the technologies and industries addressed in this book. For those who so generously shared their expertise, experience, and well-informed opinions with me in the course of this project and to everyone who answered my emails, took my phone calls, endured my endless questions, recommended resources, hosted visits, and patiently explained the technical details that I needed to understand, my profound thanks.

With apologies for omitting other names that deserve to be included here, I would like to mention my appreciation for the technology, research, and business insights provided by the following individuals at different stages of my research and writing, and for the permission of some to quote from our discussions: Cynthia Artin, Daniel Bailen, Kevin Belnap, Alex Brisbourne, Patrick Byars, Tommy Childress, Ed Clark, Professor Mary Culnan, Jeanie Doty, Roger Duncan, Bob Gohn, Professor D. M. Gavrilă, Ralf Hug, Professor Nicholas Imparato, Professor Sirkka L. Jarvenpää, Joe Jumayao,

Cambridge University Press

978-0-521-19519-5 - Smart Products, Smarter Services: Strategies for Embedded Control

Mary J. Cronin

Frontmatter

[More information](#)

ACKNOWLEDGMENTS XI

Paul Kafassis, Bob Lieberman, Letha McLaren, Robert Mazer, Paul Nagel, Michael R. Nelson, Steve Pazol, Fred Raab, Greg Rhode, Mark Robinton, David Rose, Mike Schagrin, Sascha Simon, Anthony Star, Mak Tarnoff, and Professor András Várhelyi. In addition, a warm thank you to the individuals who agreed to speak with me about their experiences and impressions as participants in smart meter and variable pricing energy pilot projects, and to the friends and family members who kindly let me explore the driver assistance, interactive options, and safety features of their recently acquired hybrid and passenger vehicles.

Thanks to the Carroll School of Management at Boston College for sabbatical leave during a critical stage of the project and for providing the support for two exceptional and talented graduate research assistants. To Peter Zeinoun, who worked with me during two years of background research, my abiding gratitude for the reports, technology specifications, copies of patents, industry data, and company briefings that you so cheerfully and competently provided. To Brian Boudreau, who arrived at Boston College just in time to endure deadlines, fact checking, citations, and manuscript revisions, I am equally grateful to you for making it a priority in your schedule to help me bring the project to completion. Any errors in this work are mine alone, and should not reflect on the help that I have received in the course of researching and writing it.

Finally, and most importantly, I acknowledge and thank my family for their support of this project and their understanding of the countless times when I had to choose research and writing over the joy of being with them. Rebecca and Johanna, thank you for listening at every stage and expressing an interest in reading the finished book even after hearing about it for years. To Scott, my endless thanks for your true and selfless partnership, for your reading and debating, critiquing and thereby improving each draft, and for the essential encouragement that you provided throughout.