

THE new science OF customer relationships

DELIVERING THE ONE-TO-ONE
PROMISE **WITH AI**



THOMAS H. DAVENPORT
JIM STERNE

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of Customer
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WILEY

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Published by John Wiley & Sons, Inc., Hoboken, New Jersey.

Published simultaneously in Canada.

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Library of Congress Control Number: 2025909894

Hardback ISBN: 9781394319541

ePDF ISBN: 9781394319565

ePub ISBN: 9781394319558

oBook ISBN: 9781394320035

Cover Design: Wiley

Cover Image: Avatar portrait silhouettes. © Medesulda/Getty Images

*Tom dedicates this book to his beloved sister-in-law,
Kim Bunch, who has loved and supported his
entire extended family in multitudinous ways
throughout her life.*

Jim dedicates this book to Colleen.

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About the Authors

Thomas H. Davenport is the President’s Distinguished Professor of Information Technology and Management and Faculty Director of the Metropoulos Institute for Tech and Entrepreneurship at Babson College, Fellow at the MIT Initiative on the Digital Economy, and Senior Advisor to Deloitte’s Chief Data and AI Officer program. He teaches artificial intelligence courses in executive programs at Babson, Harvard Business School and School of Public Health, Brown University, and MIT Sloan School.

Davenport pioneered the concept of “competing on analytics” with his best-selling 2006 *Harvard Business Review* article and 2007 book. His most recent book is *All Hands on Tech: The AI-Powered Citizen Revolution*. He wrote or edited 25 other books (including 5 other books on AI) and more than 200 articles for *Harvard Business Review*, *Sloan Management Review*, the *Financial Times*, and many other publications. He is a regular contributor to the *Wall Street Journal* and *Forbes*. He has been named one of the top 25 consultants by *Consulting News*, one of the 100 most influential people in the IT industry by Ziff-Davis, and one of the world’s top 50 business school professors by *Fortune* magazine. He is the most often cited researcher in the business information systems field in the world. He was also a “Top Voice” on LinkedIn in 2016 in the education industry and in 2018 for technology.

Jim Sterne focuses his 45 years in sales and marketing on using technology for marketing. He sold business computers to companies that had never owned one in the 1980s, consulted and keynoted about online marketing in the 1990s, founded a conference and a professional association around digital analytics in the 2000s, and has lately been advising companies on the adoption of generative AI. He has written 12 books on Internet advertising, marketing, and customer service, including the humorous *Devil's Data Dictionary*. This is his second book on AI after *Artificial Intelligence for Marketing: Practical Applications* (2017).

Sterne has consulted to some of the world's largest companies and has lectured at MIT, Stanford, USC, Harvard, and Oxford. Since 2002, Sterne has remained active producing the Marketing Analytics Summit and spent 20 years with the Digital Analytics Association as co-founder and Board Chair Emeritus. He was named one of the 50 most influential people in digital marketing by one of the United Kingdom's premier interactive marketing magazines and was included in a list of the Top 25 Hot Speakers by the National Speakers Association. Sterne is on the advisory board of a variety of startups, and has served on the boards of his local library foundation, the Better Business Bureau, and the Editorial Board of the Applied Marketing Analytics peer-reviewed journal. His current passion is leveraging generative AI as a catalyst for innovation as seen in his TEDx presentation.

Acknowledgments

From Thomas H. Davenport: I want to acknowledge the energy, expertise, and enthusiasm of my co-author, Jim Sterne, whose work on various marketing-related technologies I have admired for several decades now. It's great to finally get to work with him on a book and to occasionally get to meet face-to-face in Santa Barbara.

I'm grateful to all the generous individuals who shared knowledge with us that ended up in this book—with or without their express permission—including (in no particular order) Don Peppers, Hamit Hamutcu, Jeff Goldman, Gary Loveman, Mike Thompson, Brian Ames, Giles Pavey, Fred Reichheld, Vipin Gopal, Judah Phillips, Ryan Nelson, Tom Redman, Randy Bean, Andy Palmer, Ian Barkin, and Jake Collins. We also appreciate those companies and individuals who have gone public with their case studies, surveys, analyses, musings, etc.—we hope you are happy with being in our many footnotes!

At Wiley, we'd like to thank our editor, Jim Minatel, who was positive about the book topic from the beginning and was extremely easy to work with. Kim Wimpsett was quick and helpful in project managing and editing the book, and Annie Melnick was a pleasure to collaborate with on the cover.

From Jim Sterne: My first debt of gratitude is owed to Thomas H. Davenport. He has been an inspiration, a role model, and an inveterate teacher for more than a decade. I am very grateful for his willingness to take me on as co-author and his gentle—might I say professorial way—of encouraging me to do more and better.

There are many I relied on to help me understand this new and exciting technology, including Paul Roetzer and Mike Kaput through their Marketing AI Institute and the conference where I met Jessica Hreha, Jeff Coyle, Adam Brotman, Christopher Penn, and Dale Bertrand, from whom I've learned so much.

Thanks to Jason Comier for his engaging AI Marketing Forum and to Andy Crestodina for his brilliant vision of applying generative AI to marketing. Many thanks to the innumerable people who answered my immeasurable questions about generative AI, including but certainly not limited to Kevin Davis, Kevin Lindemann, and Mike Weaver.

This last group is a curious bunch. They are podcasters, newsletter writers, and LinkedIn posters who have no idea how much they helped me. But in this age of constant and unrelenting change, classical methods of learning have given way to weekly updates. And so, my hat is off to Reid Hoffman, Kevin Roose and Casey Newton, Kara Swisher and Scott Galloway, Ethan Mollick, Nilay Patel, Sam Charrington, Brian McCulloch, and Kevin Scott. Your work is helping multitudes.

Introduction

We'll begin this book a bit unusually, with a fictional email from the near future:

To: TomSterne@gmail.com
From: New_Vehicle_Marketing@toyota.com
Date: July 20, 2026
Subject: New Toyota Offer

Dear Mr. Sterne,

You asked that we communicate with you on offers of Toyota automobiles and services, and this email is such a message. From public data and information from the Toyota Connect service on your vehicle to which you subscribe, we have observed that:

- Your 2022 RAV4 Prime is now out of warranty, though it has very low mileage of 12,343 miles over four years (as of yesterday) and a perfect service record at our service centers.
- We noted from public vehicle data that you usually purchase a new vehicle when the previous one is out of warranty.
- We also noted from the data that you have a fully electric car, a Hyundai IONIQ 6, registered in Massachusetts, and owned two fully electric cars before that.
- Your RAV4 Prime, a plug-in hybrid, is regularly plugged in to charge by you or other drivers of the car.

- Toyota Connect tells us that 92% of your trips involve fewer than 200 miles.
- Toyota Connect weight and rearward-facing visibility sensor data tells us that your car is often fully loaded.
- Most of your calls to our technical service line have involved scheduled charging at home to save on utility costs.

Given this information, we would like to offer you a reduced loyalty price on the new 2027 Highlander Platinum all-electric SUV. It has more passenger and storage capacity than the RAV4, and its electric range is well over 200 miles. It has a new, easy-to-use scheduled charging system that makes charging your vehicle at the lowest cost almost automatic. Platinum is the highest trim level on the Highlander electric, consistent with that on your current RAV4 Prime. And we understand that you see the benefits of fully electric vehicles.

Given the low mileage and service record on your RAV4 Prime, we are also prepared to offer you the highest estimated value (subject to an appraisal) on your trade-in. Combining the reduced price on the 2027 Highlander EV Platinum (\$52,545) and the trade-in value on your RAV4 Prime (\$35,700), you would be able to purchase the new car for less than \$17,000, not including tax and licensing fees.

We would be happy to bring the new car to your home for a test drive, appraise your current car's trade-in value, and complete all administrative paperwork, all in one short visit. If this offer appeals to you, please let us know by 31 August 2026. If you have questions about it, please visit our ToyoSmart intelligent chatbot on Toyota.com or the Toyota mobile app and provide your name. It is familiar with the details of the offer, the data used to create it, and the vehicles involved.

Sincerely,
Your Friends at Toyota Motor North America

Such a highly personalized offer is technically possible today, although to our knowledge neither Toyota nor any other automobile companies (including digital native car companies like Tesla) makes such offers. We're not picking on Toyota—we both own and like their vehicles—but they market and sell cars (at least in the US) in the same nonscientific way that

other companies do. Most companies in other industries also don't use these personalized and targeted approaches. But why not, given that we've been told for several decades that personalized, targeted marketing, sales, and service are the way to achieve better customer relationships? Why not, given the explosion of available data and the amazing capabilities of analytics, artificial intelligence (AI), and autonomous agents?

These are the questions that inspired us to write this book. We've both closely followed developments in the science and technology of customer relationships for the past several decades, and we've been impressed by the technological progress but underwhelmed by the lack of improvement in customer connections and engagement. It was time that the two of us explored the science of how classic data exploration, analytical AI, and generative AI can make the most of data and analytics to boost customer relationships:

Thomas (Tom) Davenport is a professor who has written many books on analytics, AI, and other business technologies, and he's been interested in how technology affects marketing and other customer-facing functions since the 1990s. However, he remains puzzled about the regular bombardments of marketing and sales materials he receives that have nothing to do with his attributes or interest. Jim Sterne has written several books on such topics as ecommerce, web analytics, and AI in marketing—and speaks and advises often on such topics—but he's also convinced that companies can do much better than they are currently doing in these domains.

Of course, technology is always changing, and it has changed a lot in the past couple of years. Jim is convinced that generative AI just might be the key that unlocks the one-to-one marketing door. Tom is certainly dazzled by what generative AI can do but isn't as sure that it will be enough to break things open. But both of us believe that it's not enough by itself to bring about effective and highly personalized customer relationships.

The science of customer relationships is also evolving rapidly. While companies have long relied on intuition and experience to understand their customers, we're now seeing the emergence of more scientific approaches that combine rigorous data analysis, controlled experiments, and reproducible results.

For example, in the case of the fictional Toyota offer in the previous email, it's likely that the content of the email will have been created by generative AI. Perhaps there might even be agents that would go out to

different data sources and pull the needed data together to make the offer. But there are also business and organizational challenges that would have to be overcome before such an offer would be feasible.

For example, this fictional offer is from Toyota Motor North America, rather than a dealer. Who would make such an offer—the company or the dealer? Offers and prices are set by dealers at the moment, which is rather inefficient. It would seem that such a personalized approach made from the company overall would rival the knowledge of a dealer salesperson. And there might be no need for a showroom if cars were brought to the customer directly. Changes of this nature would involve difficult and time-consuming negotiations with the existing dealership structure, and they might never happen at all.

The offer draws on a wide variety of data sources and is processed with a variety of intelligent applications (see Figure I.1). Most of these actually exist today, but they would likely be difficult to integrate in order to create the offer. A household might have cars that are registered to different owners within it, for example. Information from service transactions might readily be captured and summarized by generative AI, but service departments collaborating with marketing and sales functions might be more challenging.

In short, it seems likely that the nontechnical changes to create such an offer might be greater than the technical challenges involved. There should be little doubt that the needed technical capabilities will be available by 2026, but the needed organizational and business capabilities may take much longer to become widespread.

Does this offer constitute customer science? We define that term as a concerted and continuous attempt to understand what customers want and

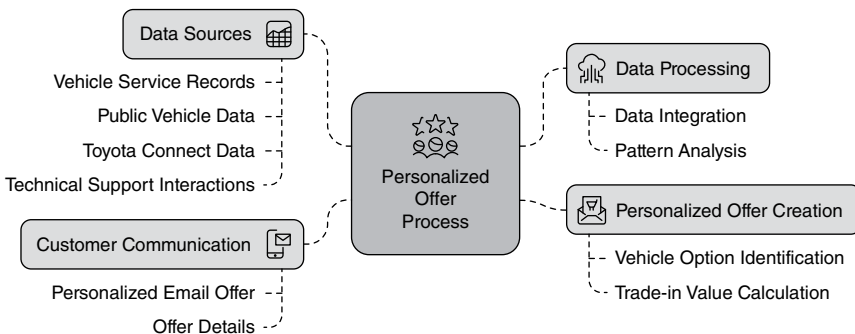


Figure I.1 The hypothetical personalized offer process.

need using data and technology, and to offer them only products, services, and advice that are targeted to meet those desires and requirements. The fictional Toyota email appears to be scientifically targeted to the customer's need for a new car. However, we can't verify that the customer wants a new car—the response or lack thereof to the email could provide clues. And we can't label it “customer science” without seeing a long-term pattern of such marketing and sales approaches. One-off experiments seldom lead to scientific breakthroughs, and one-off targeted offers don't lead to great customer relationships over time.

In this book we describe the technologies, the science, the related business issues, and the organizational and behavioral changes necessary to dramatically improve customer relationships. The one-to-one concept of personalization is discussed in detail, with reflection on why it has not come to pass in most organizations in the more than 30 years since it was defined. But we also discuss other aspects of customer-facing technologies, including the voice of the customer, automation of marketing activities, AI agents and related technologies, customer-facing operations, and many other topics with regard to customer issues. Much of the book is focused on improvements in these areas: better AI, better data, better technologies, better analytics, etc. All of these taken together—along with a sincere desire to improve the lives of customers—constitute customer science.

We've tried to strike a balance in the level of optimism about new technologies, particularly AI and generative AI. We aim to take a scientific approach, examining the evidence both for what works and for what doesn't in using technology to improve customer relationships. Even the chapters that are primarily about these technologies also mention issues of integration with the existing technology architecture, organizational adoption and absorption, and the achievement of business value.

We've also tried to provide some historical perspective, without making this book primarily about history. Since one of the motivational questions for the book is why it's taking so long to get the customer relationships that technology and technologists have long promised, we do briefly discuss the history of customer-oriented information technology, particularly in Chapter 1. But far more pages are devoted to contemporary technologies than historical ones, and we focus more on looking forward than looking backward.

The chapters in the book are briefly described here:

Chapter 1: The Broken Promise of Customer Data and Technology.

This chapter describes how customer data and technology have largely not yet produced the customer relationships every company desires. It describes the different types of customer data, the different technologies used to manage and transact with it, why one-to-one marketing hasn't come about in most organizations, and why we're more optimistic about the future.

Chapter 2: The Future Is Here, but Unevenly Distributed. Marketers, sales managers, and customer service executives have been trying to use information technology to improve customer relationships for years. Some organizations have been successful. In this chapter we describe two prominent companies that have put data, analytics, and AI to work successfully.

Chapter 3: Better AI: Generative AI as a Catalyst for Change.

Generative AI burst into the public's consciousness only a couple of years ago, but it has transformed expectations and dialogue about how AI can impact business. In this chapter we introduce the technology, describe several ways that it could transform customer relationships, and discuss some tactics to make it more useful.

Chapter 4: Better Data. You can't create good AI or models without good data, and there are many potential sources of data on customers. We describe the options and discuss how organizations can develop an effective customer data strategy.

Chapter 5: Better Personalization and Hyper-Personalization. One of the key objectives of customer data and technology has been the personalization of ads, offers, and communications. In this chapter we discuss why it has taken so long and how some organizations do it well.

Chapter 6: Better Customer Voice Analysis and Action. Customer communications go both ways, and AI increasingly makes it possible to understand and act on communications and sentiments from customers. We describe how to make the customer voice more understandable and actionable, and how to improve customer service based on it, in this chapter.

Chapter 7: Better Task Automation with AI Agents. Marketing and customer service had automation programs in the past, but they were inflexible and not data-driven. AI agents are the new cool thing, and we explore how they can and will support customer-facing applications in this chapter.

Chapter 8: Better Customer-Facing Operations. There are many departments in most companies that interact with customers. In this chapter we describe ways in which they can cooperate more effectively—often with the help of technology—to increase customer engagement and satisfaction.

Chapter 9: Better Customer Analytics and Data Science. Behind the AI models that personalize and understand customer interactions, there are analytics and data science models that make them possible. Some are old and some are new, and we discuss how to use them effectively on behalf of customers in this chapter.

Chapter 10: Better Ethics. It's great to take advantage of customer data, but there are ethical limits to what's feasible and desired by customers themselves. In this chapter we focus on how organizations can walk the line between ethical and creepy.

Chapter 11: The Customer of Tomorrow. We conclude the book with a discussion among a company's executives and their AI helpers about what kinds of customer data and technology would make for an ethical and highly effective customer experience. The hypothetical script is interspersed with real lessons about what really works for customers.

1

The Broken Promise of Customer Data and Technology

Of all the different types of data within organizations, customer data is perhaps the most important. It informs a company about what customers have bought, what kinds of people they are, and what they might buy in the future. It is the key to knowing whether customers are satisfied or dissatisfied. It reveals what products and services they might find appealing in the future. At the most basic level, customer data includes where to ship the product, how it's being paid for, and whether the customer is likely to renege on payment or return the product.

We typically think of only companies as having customers and customer data, but government agencies and nonprofits have their equivalent. Governments can apply the science of customer analysis. Knowing how constituents feel about their leaders and the services they receive is extremely important to their success. Nonprofits have both contributors and recipients of services; they're different types of customers, but keeping track of both is critical to success.

We will argue in this book that customer data and technology have often not delivered on their promises or potential. Perhaps that's a good thing for

us, or you would have little motivation to buy and read these words and images. For more than 30 years, we've heard about one-to-one marketing, a 360-degree view of customers, personalization and hyper-personalization, multi- and omni-channel relationships, etc., *ad infinitum*. Despite decades of progress in the science and technology of analytics and customer modeling, the practical application of these methods has remained elusive.

If you're not skeptical of these concepts, you probably aren't paying a lot of attention to the gap between how marketing is described and how we observe it in practice. Of course, the appeal and importance of these concepts and capabilities is unquestionable. It's certainly possible to imagine a world in which customer data and technologies were used very effectively to improve the course of customer relationships. Analytics and artificial intelligence have already had a positive impact on these relationships, and generative AI and agentic technology will go much further.

If these technologies are used effectively, what will the future look like? If customer data were captured, stored, and used effectively, for example, we would know about virtually every interaction a customer has with an organization—purchases, returns, product or service usage for online offerings, web and mobile views and clicks, related social media comments, summaries of calls to the customer service center, and even subjects addressed in informal chats with salespeople or other company representatives. All of that information could be combined into customer lifetime value predictions, propensity-to-purchase models for particular products and services, churn predictions, accurate personalization of virtually every ad or offer, and detailed attribution of a customer's channel activity and path-to-purchase. Many of those analyses would be powered by traditional analytical AI based on machine learning and structured data.

Generative AI has further potential to enhance customer relationships. By harnessing the capabilities of machine learning and data integration, it could automate many textual and visual offerings to customers and provide extensive personalization of each interaction. It could analyze a customer service email or the content of a phone call or text chat, pass along relevant feedback to the individuals involved in addressing the customer need, and alert the customer about what action has been taken. The idea of standard product copy or images would become obsolete. "Agentic" AI, or a somewhat autonomous AI system that can make decisions and take actions rather than just responding to prompts, could automatically determine a

customer need, make an immediate recommendation of how to address it, and complete the purchase transaction with customer approval.

Much of this glittering image of data- and technology-enhanced customer relationships is technically possible today. However, as we'll discuss later in this chapter, at various times in recent history we've been promised other revolutions in customer interaction, and we're still waiting to see them. It's a rare event for either of us, for example, to receive a marketing offer from a company for a product we really want but haven't already searched for. In the remainder of this chapter, we'll discuss the history of customer data and technology and explain why a scientific approach to customer relationships hasn't been achieved.

The Nature of Customer Data

As in any scientific endeavor, effective customer relationship management requires rigorous collection and analysis of data to generate meaningful insights. Customer data—for better or worse—is multifaceted. It consists of such elements as these:

- **Transactions:** Sales, shipments, payments, website and mobile clicks, customer support tickets, and the like.
- **Attributes:** Names and addresses, demographic information, credit card numbers.
- **Structured opinions:** Customer satisfaction ratings, net promoter scores, whether purchases are returned; web and mobile site views.
- **Unstructured opinions:** Website comments, social media comments, customer service calls, comments to salespeople.
- **Calculations:** Segmentation, engagement, acquisition cost, recency, frequency, monetary (RFM) analysis, customer lifetime value.
- **Predictions:** Recommended products or services, likelihood of attrition (churn), price the customer is willing to pay.
- **Experimental results:** A/B tests, controlled trials, and other scientific methods of testing hypotheses about customer behavior and preferences.

Customer data, then, can be a rich repository of content about one of the most important resources in business. It's hard to imagine how an organization can be very successful without managing customer data well.

Amazingly, however, most don't do it well at all. They usually manage to stay in business, but they don't prosper as much as they might if they had and used good customer data.

Why Customer Data Is Difficult to Manage

One reason customer data often isn't managed well is simply because it's complex. Vendors often speak of their "Customer 360" capabilities, suggesting that they can handle and make sense of all forms of customer data. But as you can imagine, capturing and analyzing all the different types of data we've just described can be difficult. And doing it successfully goes well beyond software alone.

Just to keep that set of customer data elements we described earlier in play, imagine the difficulty of combining all of them in a 360-degree view of customers. Customers are always changing (addresses, credit cards, opinions), so it's hard to keep up-to-date with them. Mixing structured and unstructured data is both a technical challenge and—more importantly—an analysis and sensemaking challenge. What if the customer continues to buy from us but trashes us on social media? What if they buy a lot of our product online but return much of it after purchase? What if structured data predicts churn, but the sales rep says the customer is happy? Such potential contradictions can be difficult or impossible to resolve.

There is also the difficulty of even learning who the customer is. You may have wondered, for example, why manufacturers of durable goods often package in little cards to encourage the customer to register for warranty service. It's usually not technically necessary to register to get your warranty service, but the manufacturer wants your name and address data to try to sell you additional products. Incentives and offers included in the product packaging often have the same motivation.

This is a particular challenge for consumer goods that are sold through retail channels. In such cases, the retailer knows what you have bought, but that information is seldom passed along to the manufacturer of the product because retailers want to own the relationship with the customer. This issue has bedeviled consumer packaged goods (CPG) manufacturers for decades. As we'll discuss, some CPG firms have made considerable progress in selling to—and getting data from—consumers

through ecommerce channels. Not only does that usually increase their profit margins, but it also permits an ongoing marketing, sales, and service relationship with the customer.

That previous sentence suggests another difficulty with customer data: it's often captured and owned by different parts of an organization. Marketing owns personalized customer offers and perhaps leads from all channels. But to convert, those leads must be handed off to sales (inside or outside), which then owns them and customer information encountered through the sales process. Customer service is responsible for the problems that customers bring to an organization and the solutions to them. If there is a "customer success" function, it has custody of the information about how the customer is using the product or service and how they feel about it. Analytics or AI organizations may own the data used to train models and the predictions they make. If that's not enough owners, the research and development (R&D) group may own customer comments in focus groups or suggestions for new products and services.

Unless your company has an unusually friendly and collaborative culture, these different owners may clash when someone suggests pulling all the information about customers together into one database or customer data platform. And the ownership of that database or platform may be contentious as well. Those political and cultural issues can't be handled at all by software, even if it's highly flexible and functional. All of this has led many managers to give up on the 360-degree-view idea and to just try to manage the data they own or control about customers.

Perhaps the most basic problem of all in managing customer data effectively is defining the customer with precision and employing that definition around the company. Table 1.1 describes a set of alternative terms that could all be used to describe a "customer," for example. Tom has a vivid memory of this issue from a consulting engagement he performed with a computer company a few years ago. The company had two major distribution channels: direct sales to the end customer (generally businesses), or sales through distributors. The different channel organizations couldn't agree on whether a distributor counted as a customer. Even more problematically for financial reporting, they couldn't decide on what constituted a sale—if a product was sent to a distributor, did it count as a certified sale?