Advanced Technologies Management for Retailing
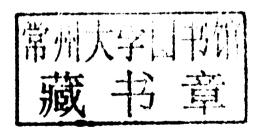
Frameworks and Cases

Eleonora Pantano & Harry Timmermans

Advanced Technologies Management for Retailing:

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BUSINESS SCIENCE
Reference

Foreword

Advanced Technologies Management for Retailing: Frameworks and Cases brings together research, insights, and practices of strategic management applications that optimize both the opportunities and challenges of emerging and flourishing technologies in retailing.

In the one hundred plus years since James Cash Penny opened his first "Golden Rule" store in the U.S., which grew to be today's "J. C. Penny" stores, the retail world has changed drastically and immeasurably. His motto of "Honor, Confidence, Service, and Cooperation," is still relevant today, and unlike many retailers, almost forty years after his death, JCPenny is flourishing and operating over 1,100 stores world-wide. The more recent story of Sam Walton is equally inspiring.

It is no longer James and Sam's retail world! Retailers are challenged by changes in customers, completion, cultures, global reach, value-chain operations/options, and the enormous impact of technology. Seemingly invincible Wal-Mart stays current with amazing real-time inventory data-base practices that were unthinkable when Sam opened his first store.

This up to date collection of observations by a multinational body of seasoned researchers and practitioners focuses on three major pieces of the new retail world: specific advances in available technologies, new sources and applications of consumer based knowledge, and the impact of these technology and knowledge advances on the behavior of consumers. The contributions in this edited work come from scholars whose home bases are in Italy, Spain, UK, Croatia, Switzerland, Denmark, USA, Canada, Germany, and Cyprus, but whose experience and research have no national boundaries. Like the authors, the applications described are not limited by national borders but are relevant wherever the value chain of contemporary retailing exists—from Peoria to Paris.

My personal observations are related to the way these technological approaches become intertwined with the strategies of the retailers wherein they are to be applied. First, readers must not lose sight of the necessity of technological leaders to communicate and persuade top managers to consider the value of new options, and the willingness and ability of the owners to fund these important new technologies. Wal-Mart invested billions on it point-of-sale data-base system that allows vendors and corporate managers to access broadly into the current status of local stores and their customer base. Acquiring a lasting strategic advantage is the goal of the technologies, and investors must be convinced that there is a rational basis for the necessary investments.

Second, the obvious implication of the value of this book is that the basic facts of change are changing. Years ago, I told business students that within 20 years they would be managing jobs and products in companies whose products didn't then exist. They did not believe it then and thought it was ridiculous. They do now! Yet, to make the same observation today would be ridiculous. Instead of twenty years, I would have to say five years. Thus is the source of the dynamics and excitement of this book. Retailers have become leaders and change agents, and are no longer simply merchandisers from the warehouses of established practices, but the creators of new and better, not just best, practices. The value-chain vehicle

begins where the fabrics of retailing originate to the end users and beyond. Now retailers must offer customer service that often times includes obsolescence protection and buy-back options. The technologies necessary to lead, and even keep up with, the process and mechanisms of the new applications in marketing must themselves evolve. And the research on the consumers must continuously grow and keep up.

Third, marketing technology and strategy are facing a major new constraint: sustainability. Corporate strategy is evolving to acknowledge the need to be part of a sustainable world future, and marketing should take a major lead in that new normalcy. My business students' of years ago would have not believed that the issue of sustainability should have any role in marketing or corporate strategy. But they do now!

Fourth, this technology should not be for the retail giants such as IKEA or Carrefour, but should be developed in such a way as to encourage wide-spread diffusion into various marketing segments for small firms as well as large firms, developing nations as well as economically advanced nations, entrepreneurial enterprises as well as well established corporate firms, industrial firms as well as consumer oriented firms, and so forth. Widespread diffusion of new knowledge will happen when these applications are published in widespread outlets of technical information, not just scholarly journals. It is in this sense that I congratulate the authors and publishers of *Advanced Technologies Management for Retailing*.

Fifth, the future starts soon, and new hardware, software, and amazing new applications will come with increasing frequency. As developer and techno-entrepreneurs become more youthful, social media plays a larger and larger role in marketing applications, and the authors of these pieces become the established leaders in this exciting field, the world will be depending on this gravitas for mentoring and monitoring the values and ethics of this field. Computers are becoming much faster, and storage capacities are growing, and so are the information sources on the Internet alone, to say nothing of electronic data collection at point-of-sale is bordering on a level of privacy violation that seems uncontrollable. In his recent book *Contemporary Issues in Ethics and Information Technology*, Bob Schultz concluded that "Since ethical problems of IT confront us with new situations that cannot be handled in the same way of familiar cases, the only constant is the principles behind the cases." And then adds that the higher level principles regulate the conflicts between lower level principles. My concern is that our marketing advances in IT are the work of people who have less and less interest, education, or incentive to worry about ethical issues. Therefore, I urge the authors and readers of this work to use your leadership to maintain clear standards of ethical practices in this important field.

I believe that *Advanced Technologies Management for Retailing* provides many contributions to the scholarly and practical world of contemporary retailing, *where the consumer must remain the focus and the marketing mix remains enhanced, but unbroken.*

Robert L. Bjorklund
Woodbury University, USA

Robert Bjorklund *has degrees from the University of Sioux Falls and the University of Massachusetts, but his interest in retail marketing began in at an early age in the shoe business. His general business management and academic skills developed later, over a period of over forty years while his career moved between business (marketing, strategy, and human resources) and academia. After completing his PhD, he served as Assistant Professor at the Worcester Polytechnic Institute in Massachusetts and later as Associate Professor at the State University at NY in Utica. Shifting to business practice, he joined Hay Associates, in New York was hired by a client as VP of a consumer products manufacturer and later as VP Marketing in commercial real estate in New Jersey. He then returned to teaching at Rider University and New York University. Currently, Bjorklund is Associate Professor of Management and chair of the Management Department in the School of Business at Woodbury University in Burbank, CA. His current research interest is bank trustee boards and the success or failure of American bank members of the FDIC.*

Preface

In recent years, many studies have focused on the best practices which make stores more attractive and appealing for consumers. The application of innovative technologies at the point of sale is a promising and relatively unexplored field of study, in particular when considering the introduction of digital content and interactive technologies allowing consumers to access products in new ways. Many e-retailers have already exploited the opportunities offered by interactive technologies, such as 3D virtual models, digital products management, and knowledge transfer to consumers, in order to enhance consumers shopping experience. Their use in real stores, however, is still limited.

In this scenario, the development and use of innovative shopping assistants for supporting and influencing consumers during their shopping experience plays a key role for retailers and researchers alike. On the one hand, it improves the consumers in-store experience, on the other it gives marketers useful information on consumer preferences and needs, response to new services and retailing strategies, and on market trends. As a consequence, several current research projects focus on developing new virtual salesperson or existing shopping assistant systems, based on shopping trolleys equipped with digital displays or cameras to scan products barcodes. Adding digital and customized content to these tools can be a powerful means to influence customers' experience. The aim is to support consumers, through a user-friendly interface, by giving them fast and detailed information on products, sales, new arrivals, and so on. Consumers may use the offered information to choose among different alternatives, search for promotions, and calculate the value of purchases, by saving time and enjoying the experience.

The main characteristics are interactivity and multimodality of the interaction, in order to achieve an efficient, flexible, and meaningful feeling of interaction with a human. Therefore, it becomes very useful to deepen our understanding of the advanced technologies in a retailing context and their impact on consumer' behavior. In particular, this book aims to investigate the most useful applications of advanced technologies to retailing, the modality of the interaction between consumers and system, and the main benefits of the effective interaction. It also addresses implications for managing products and for improving consumers' knowledge to influence their subsequent buying behavior. Thus, contributions in this book relate to different fields such as Marketing, Computer Science, Psychology, and Management, to provide an integrated approach to the topic.

THE OBJECTIVES OF THIS BOOK

This volume contains original research that contributes to our understanding of applications of advanced technologies, their impact on the design and development of innovative points of sale, and of consumer behavioural intentions towards these technologies. In particular, Section 1, *"Advances in Technologies*

Management for Retailing," deepens our knowledge of the current developments for improving retailing and consumer in-store experiences. A selection of 6 chapters has been chosen to illustrate the changes in the point-of sale caused by innovative technologies capable of totally modifying store layout, payment modalities, and information transfer from and to consumers. The first chapter provides a detailed review of the current technologies available at the point of sale, by focusing barcode scanning, electronic shelf tags, shelf-checkouts, RFID tags, and fingerprint authentication; subsequent chapters highlight the evolution of the store from the traditional point-of-sale to an innovative point-of-consumer. Chapters 3 and 4 investigate the introduction of a specific technology in the store, respectively the Retail Digital Signage, and an advanced Virtual Shopping Assistant; Chapter 5 "*Information and Communication Technologies in Marketing Channels: Product Considerations*" analyzes the new technologies introduced in the different distribution channels more generally, with emphasis on consumer evaluation of these technologies. The last chapter of this section focuses on the Enterprise Architecture for retailing, in order to underline its benefits for innovating, improving, enriching, and increasing the interaction between business and technology.

Section 2, "*Digital Contents Management for Technology-Based Retailing,*" analyses digital contents management for innovative, technology-based retailing in terms of information representation, transferring, and searching. In particular, Chapter 7 highlights an integrated conceptual representation of consumer group knowledge, which includes both the influence of collective variables on the decision making process and the investigation of scientific inquiries concerning the role of advanced technologies in relation to the conceptual representation. The successive chapters focus on the use of Web 2.0 or social media as a powerful tool for customizing digital contents, supporting consumer decision making, and improving consumer consumption experience, with emphasis on how by these technologies might be successfully used for building consumer loyalty, improving relationships with consumers, and creating value for e-retailers in the tourism sector. Furthermore, it is possible to exploit Customer Intelligence to collect a substantial amount of information on consumer needs, attitudes, and preferences towards a certain retailer in order to enhance the consumer-retailer relationship and improve the business decision, as illustrated in Chapter 9. With the same purpose in mind, Chapter 10 provides useful ideas for retailers for collecting and managing a large amount of information on consumers, by outlining which variables are capable of major improvements in information sharing in online settings. In the chapter "*You Never Get a Second Chance to Make a First Impression: Meet Your Users' Expectations Regarding Web Object Placement in Online Shops,*" the authors propose a mental model for the development of efficient website interfaces, which can be used for the improving websites devoted to online shops.

The chapters included in the Section 3, "*Impact of Advanced Technologies on Consumers Behavior,*" aim to investigate the impact of advanced technologies on consumers behavior in terms of consumer opinions, interaction modalities, and purchasing decisions. In particular, Chapter 12 analyses the online recommendation systems by outlining the strength link between consumer acceptance of these systems and the quality and shopping relevance of the provided recommendations. The various chapters focus on the relationship between Human-Computer Interaction (HCI) and aspects of consumer behavior with emphasis on the electronic retail context (e-tailing), by highlighting how 3D interfaces become a key factor for the success of online retail environments. Chapters 14, 15, and 16 exploit the use of the Technology Acceptance Model for analyzing consumers' intentions to adopt a new technology. In particular, chapter 14 focuses on the introduction of mobile purchasing decision support systems at the point of sale, by evaluating their impact on consumer behaviour. Chapter 15 outlines the direct and indirect effects of perceived usefulness, ease of use, and enjoyment on consumer acceptance of new technology in grocery retailing, by taking into account individual experience with Information Technologies. The last chapter investigates the impact of WiFi on consumer behaviour and attitude towards the new technology.

THE TARGET AUDIENCE

The book should be interesting for scholars of Economics, and in particular of Marketing, Management/ Industrial Engineering, scholars of Computer Science, and scholars of Psychology. Researchers in these fields can obtain useful information about the latest results in these fields of study, as well as on the potential use of advanced technologies in retailing.

THE VALUE OF THIS BOOK

Presenting a wide number of technologies linked to consumer behaviour in retail environments (i.e. RFID, Shopping Assistant Systems, smart mirror, and so on), the book undoubtedly has an appeal for scholars in Marketing and Management, as well as in Psychology. In particular, it discusses case studies investigating the phenomenon of consumer-computer interaction, which suggest applying these new technologies to influence buying behaviour. The book adds to current research by enriching the frameworks at the disposal of the scholars interested in this field of study, highlighting how the technologies may be used to influence consumer behaviour in a retailing context.

The book provides:

- Complete analysis from a bibliographic point of view on the application of advanced technologies in retailing, including the research on the consumer acceptance of these technologies, product knowledge transfer, and consumer-computer interaction
- A complete view of consumer behaviour in ubiquitous/pervasive environments
- A complete view of research on the digital contents management for retailing
- A first collaborative approach to retailing and the potential of Computer Science in the generation of advanced systems capable of influencing consumer buying behaviour.

Therefore, this book is unique in its kind because the literature on the topic addresses only some of the subjects described, and almost completely separates consumer behaviour and the field of Computer Science. In particular, the authors emphasize the relevant connections between Retailing, Computer Science, and Psychology. These connections can be exploited to individualize innovative advanced systems for influencing consumers' buying behaviour, based on the current research in retailing, knowledge management, and human-computer interaction. The book fills an important gap, because there does not yet exist a text specifically devoted to the application of advanced technologies to retailing.

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Section 1
Advances in Technologies Management for Retailing

This section deepens our knowledge of the current developments for improving retailing and consumer in-store experiences. A selection of 6 chapters has been chosen to illustrate the changes in the point of sale caused by innovative technologies capable of totally modifying the stores layout, payment modalities, and information transfer from and to consumers.

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Section 1
Advances in Technologies Management for Retailing

This section deepens our knowledge of the current developments for improving retailing and consumer in-store experiences. A selection of 6 chapters has been chosen to illustrate the changes in the point of sale caused by innovative technologies capable of totally modifying the stores layout, payment modalities, and information transfer from and to consumers.

This chapter provides a detailed review of the current technologies available at the point of sale, by focusing barcode scanning, electronic shelf tags, shelf-checkouts, RFID tags, and fingerprint authentication. Furthermore, the chapter outlines possible future developments of these technologies and the emerging trends.

The chapter investigates the changes in the retailing sector, due to the advances in technologies, by highlighting the evolution from the traditional point-of-sale (POS) to an innovative point-of-consumer (POC).

The authors focus on the consumer perception of in-store atmospheric stimulus, with emphasis on how the introduction of digital signage might affect this process. In particular, they carry out qualitative and quantitative results useful for improving business-to-consumer appeal to shoppers, as well as for the business-to-business marketing of these systems to retailers.

The authors propose an innovative shopping assistant system for improving consumer experience, by supporting and influencing his/her in-store behaviour. The system has been designed by taking into account the basic selling skills, the principles of knowledge management, and current advances in computer graphics and human-computer interaction to develop a new virtual salesperson.

The authors analyze the Information and Communication Technology (ICT) introduced by retailers in different distribution channels, as well as the consumer evaluation of the proposed technology, in order to carry out important issues for researchers and practitioners.

This chapter focuses on the Enterprise Architecture for retailing, in order to underline its benefits for innovating, improving, enriching, and increasing the interaction between business and technology. In particular, the author analyses the case of a fashion firm.

Section 2
Digital Contents Management for Technology-Based Retailing

The main focus of this section is the analysis of digital contents management for a new technology-based retailing in terms of information representation, transferring, and searching. In particular, the selected chapters investigate how it is possible to collect, exploit, represent, and manage the information for achieving useful data for predicting and influencing consumer behavior.

The authors highlight an integrated conceptual representation of consumer group knowledge, which includes both the influence of collective variables on the decision making process and the investigation of scientific inquiries concerning the role of advanced technologies in relation to the conceptual representation.

The chapter focuses on the use of Web 2.0 or social media as a powerful tool for customizing digital contents, supporting consumer decision making, and improving consumer consumption experience in the tourism sector by outlining how this technology can be successfully used for building consumer loyalty, and improving relationships with consumers, as well as for creating value for e-tailers.

The aim of the chapter is to outline how it is possible to exploit Customer Intelligence to achieve a wide amount of information on consumer's needs, attitudes, and preferences towards a certain retailer, in order to enhance the consumer-retailer relationship and improve the business decision. The research has been carried out by focusing on the case of Croatian market.

Katia Premazzi, Bocconi University and SDA Bocconi, Italy
Monica Grosso, Bocconi University and SDA Bocconi, Italy
Sandro Castaldo, Bocconi University and SDA Bocconi, Italy

This study provides useful ideas for retailers in collecting and managing a large amount of information on consumers. In particular, the results outline which variables are capable of major improvements in information sharing in online settings.

Javier A. Bargas-Avila, University of Basel, Switzerland
Sandra P. Roth, University of Basel, Switzerland
Alexandre N. Tuch, University of Basel, Switzerland
Klaus Opwis, University of Basel, Switzerland

Authors propose a mental model for the development of efficient website interfaces, which can be used for the improving websites devoted to online shops.

Section 3
Impact of Advanced Technologies on Consumer Behaviour

The chapters included in this section aim to investigate the impact of advanced technologies on consumer behavior, in terms of consumer opinions, interaction modalities, and purchasing decision, in order to outline the characteristics capable of major influencing their behavior, as well as the directions for innovative and effective retailing strategies.

Daniel Baier, Brandenburgische Technische Universität Cottbus, Germany
Eva Stüber, Brandenburgische Technische Universität Cottbus, Germany

This chapter focuses on the analysis of consumer acceptance of the online recommendation systems, by exploiting the use of Technology Acceptance Model (TAM). The study outlines the strength of the link between the acceptance of these systems and the quality and shopping relevance of the provided recommendations.