

GENERATIVE AI FOR RETAIL INNOVATION

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Generative AI for Retail Innovation

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Generative AI for Retail Innovation

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CONTENTS

FOREWORD	i
PREFACE	ii
LIST OF CONTRIBUTORS	iv
CHAPTER 1 WHEN AI MEETS THE AISLES: THE FUTURE OF PHYSICAL RETAIL	1
<i>.Gabriela B. Kurtz, Vaishali Sethi and Roberto Mena G</i>	
INTRODUCTION	1
Motivation of the Chapter	2
Challenges of the Topic	2
Significance and Implications	2
Research Gaps and Contribution	2
LITERATURE REVIEW	3
AI Landscape: Past, Present, and Future	3
HISTORICAL EVOLUTION OF RETAIL AND AI AND THE CURRENT LANDSCAPE	4
RESEARCH METHODOLOGY	4
RESEARCH FINDINGS	5
Trends in AI and Physical Retail	5
<i>Category 1: Interviewees' Backgrounds</i>	6
<i>Category 2: General Perspectives and AI Applications in Retail</i>	6
<i>Category 3: Customer Experience and Emerging Trends</i>	9
<i>Category 4: Opportunities and Future</i>	12
IMPLICATIONS	15
CONCLUDING REMARKS	15
CONSENT FOR PUBLICATION	17
CONFLICT OF INTEREST	17
ACKNOWLEDGEMENTS	17
REFERENCES	17
CHAPTER 2 REVOLUTIONIZING RETAIL: HOW AI IS SHAPING PERSONALIZED CUSTOMER EXPERIENCES	21
<i>Arnav Satija, Sarthak Arora, Anshu Lochab and Ryka Nanda</i>	
INTRODUCTION	21
LITERATURE REVIEW	22
MOTIVATION FOR THE CHAPTER	24
CHALLENGES OF THE TOPIC	25
SIGNIFICANCE AND IMPLICATION	26
ENHANCING CUSTOMER EXPERIENCE THROUGH THE IMPACTS OF ARTIFICIAL INTELLIGENCE TECHNOLOGIES	27
GENAI IN THE BUSINESS WORLD	29
GENERATIVE ARTIFICIAL INTELLIGENCE IN THE RETAIL VALUE CHAIN	31
Developing More Flexible and Versatile Value-Retail Chains	31
DEFINING ARTIFICIAL INTELLIGENCE	32
AI Enabler and Categories	33
Strategic Integration of AI in Retail	33
RETAIL VALUE CHAIN AND AI	35
IMPLEMENTATION OF GENAI IN PRODUCT DESIGN AND DEVELOPMENT	35
GenAI in Customisation and Personalisation	35
Outsourcing and Processing	36
AI in Product Assortment Recommendations	36

AI for Optimizing Production Quantities	37
AI for Anticipating Customer Needs	37
Artificial Intelligence in Quality Management	37
AI in Garment Production	38
AI Predictive Maintenance	38
Inventory Control and Distribution Management	38
AI Assisting in Range Planning and Optimization	38
THE EVOLUTION OF AI-ENABLED PERSONALIZATION IN RETAILING	39
The Older Ways of Personalization	39
AI-enhanced Personalization	39
Generative AI and Its Emergence	39
AI for Building a Personalized Shopping Experience	39
AI Chatbots and Virtual Shopping Assistants	39
Personalized Marketing With AI-Driven Content	40
Predictive Analytics for Anticipating Customer Behaviour	40
AI-assisted Real-time Pricing and Dynamic Promotion	40
Case Study of DeepSeek AI	40
DEEPSEEK AI INFLUENCE ON PERSONALIZATION IN THE RETAIL SECTOR	42
Elevating Engagement	42
Widening AI's Multimodal Functionality	43
Enhancing AI's Scalability and Operational Efficiency	44
Benefits of Generative Artificial Intelligence in Retail: Enhanced Customer Engagement and Loyalty	44
Enhanced Operational Efficiency	45
Scalability and Real-Time Adaptability	45
Enhanced Competitive Advantage	46
CHALLENGES AND ETHICAL CONSIDERATIONS	46
Data Privacy and Security Concerns	46
Algorithmic Bias and Equity	46
Transparency and Understandability	46
Ethical Management of AI-Generated Content	46
FUTURE TRENDS AND INNOVATIONS	47
AI-Driven Hyper-personalization	47
Emergence of Voice and Conversational AI	47
Synergy of AI and Blockchain for Enhanced Security	48
Potential Advantages and Challenges Posed by Generative AI	49
CONCLUSION	52
REFERENCES	54
CHAPTER 3 AI SERVICE TOOLS: THE NEXT PHASE FOR RETAIL'S CUSTOMER RELATIONSHIP	57
<i>Chahat Malhotra and Kirti</i>	
INTRODUCTION	57
THE EVOLUTION OF AI SERVICE TOOLS IN RETAIL	59
Realistic Content Creation	59
<i>Product Descriptions</i>	59
<i>Visual Content</i>	59
<i>Video Campaigns</i>	59
Interactive Experiences	60
CHALLENGES OF AUTHENTICITY	60
DRIVING FORCES BEHIND AI SERVICE TOOLS	61

Advanced Deep Learning	61
Vast Data	61
Increase in Accessible Tools	61
THE TRANSFORMATIVE ROLE OF AI SERVICE TOOLS IN RETAIL	61
How AI Service Tools Enhance Retail Customer Relationships	62
Conversational Commerce: Building Connections with Human-like Interactions	63
Visual Customization: Bringing Products to Life	63
Revamping Marketing Campaigns with AI Service Tools	64
<i>Hyper-Personalized Messaging</i>	64
<i>Automated Content Creation</i>	64
<i>Localized Campaigns</i>	65
Transforming Customer Support with AI Service Tools	65
<i>24/7 Customer Service: Support Anytime, Anywhere</i>	65
<i>Empathy at Scale: Emotionally Intelligent Support</i>	66
<i>Scalable Support: Handling High Demand with Ease</i>	66
<i>Additional Advantages of AI Service Tools in Customer Support</i>	67
HOW GENERATIVE AI IS SHAPING THE RETAIL INDUSTRY	67
Boosting Efficiency, Simplifying Operations, and Cutting Costs: AI is Shaping the Retail Industry	67
Strengthening Customer Loyalty with Personalized Experiences	68
Adapting Instantly: Staying Ahead in a Dynamic Market	69
Creating Unique Shopping Experiences	69
ETHICAL CHALLENGES AND CONSIDERATIONS OF GENERATIVE AI IN RETAIL	70
Digital Trust and Authenticity	70
<i>The Challenge</i>	70
<i>The Solution</i>	70
Consumer Privacy	70
<i>The Challenge</i>	70
<i>The Solution</i>	71
Cultural Awareness and Sensitivity	71
<i>The Challenge</i>	71
<i>The Solution</i>	71
Over-Reliance on AI	71
<i>The Challenge</i>	71
<i>The Solution</i>	71
THE FUTURE OF AI SERVICE TOOLS IN RETAIL	72
Emotionally Intelligent Virtual Assistants	72
Predictive Analytics	72
IoT Integration	72
METHODOLOGY	72
IMPLICATION	73
CONCLUSION	75
CONSENT FOR PUBLICATION	75
CONFLICT OF INTEREST	76
ACKNOWLEDGEMENTS	76
REFERENCES	76
CHAPTER 4 TRANSFORMING CUSTOMER LOYALTY DYNAMICS USING AI TECHNOLOGIES	79
Chahat Malhotra and Meenakshi Azad	
INTRODUCTION	79

ROLE OF AI TECHNOLOGIES IN INCREASING RETENTION OF CUSTOMERS AND IMPROVING CUSTOMER LOYALTY	81
Giving Recommendations to Customers	81
AI Tools Drive Personalized and Customized Experience for Employees	82
Increases Customer Satisfaction	82
Enhance Customer Experience with AI	82
Retention of Old Customers	83
Improves Banking Experience	83
BEST TOOLS OF AI FOR ENHANCING CUSTOMER LOYALTY	84
Intelligent Personal Assistant (IPA)	84
AI Chatbots	84
Artificial Intelligence Marketing (AIM)	84
Machine Learning Models	84
Service Robots	85
Digital Virtual Assistants	85
CHALLENGES IN IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE	85
STRATEGIES TO OVERCOME THE CHALLENGES IN THE IMPLEMENTATION OF AI	86
Training and Development	87
Focus on Emotional Intelligence	87
Error Management	87
Integrating AI Tools with Human Employees	87
Designing Accurate Response Capabilities in AI Chatbots	88
Understanding Customer Preferences	88
METHODOLOGY	88
IMPLICATIONS OF THE STUDY	89
FUTURE RESEARCH DIRECTIONS	90
LIMITATIONS OF STUDY	90
CONCLUSION	90
CONSENT FOR PUBLICATION	91
CONFLICT OF INTEREST	91
ACKNOWLEDGEMENTS	91
REFERENCES	92
CHAPTER 5 THE ROLE OF GENERATIVE AI IN REDEFINING RETAIL WORKFORCE DYNAMICS: AN EMPIRICAL ANALYSIS	94
<i>Preksha Yadav</i>	
INTRODUCTION	94
Background	94
Problem Statement	95
Research Questions	95
Objectives	96
LITERATURE REVIEW	97
Generative AI	97
Generative AI in Retail	98
Workforce Dynamics in Retail	98
Theoretical Framework	99
METHODOLOGY	100
Research Design	100
Data Collection	100
<i>Primary Data</i>	100

<i>Secondary Data</i>	101
Sampling	101
Variables	102
Data Analysis	102
RESULTS AND FINDINGS	103
Data Presentation	103
AI's Effect on Employee Productivity	103
Employee Roles and Skill Development	104
Impact on Workforce Structure	105
Key Insights	105
<i>Positive Effects</i>	105
<i>Challenges</i>	106
<i>Statistical Evidence</i>	106
DISCUSSION	106
Interpretation of Findings	106
Theoretical Implications	107
Practical Implications	107
LIMITATIONS AND FUTURE RESEARCH	108
Limitations	108
Future Research Directions	108
CONCLUSION	109
REFERENCES	110
CHAPTER 6 REDEFINING THE RETAIL INDUSTRY IN INDIA THROUGH TECHNOLOGY INTEGRATION	113
<i>Durga Madhab Mahapatra, Bhabani S. Mohanty, Soumendra Kumar Patra and Zakir Hossen Shaikh</i>	
INTRODUCTION	114
LITERATURE REVIEW	117
TECHNOLOGY INTEGRATION: AR, VR, AND BEYOND	118
TECHNOLOGY AND RETAIL OPERATION	120
TECHNOLOGY AND EXPERIENTIAL MARKETING	122
CHALLENGES THROUGH TECHNOLOGY INTEGRATION	124
CONCLUSION	126
REFERENCES	127
CHAPTER 7 NAVIGATING CULTURAL DIVERSITY IN GENERATIVE AI-DRIVEN RETAIL MARKETING: A CROSS-CULTURAL INVESTIGATION	132
<i>Aliza and Mushtaq Ahmad Shah</i>	
INTRODUCTION	132
LITERATURE REVIEW	134
METHODOLOGY	138
CASE STUDIES	138
Case study 1: Amazon: Harnessing Generative AI for Personalization and Efficiency	139
<i>Amazon's Key Generative AI Use Cases</i>	139
Case study 2: McDonald's: Leveraging Generative AI for Customer Engagement and Operational Efficiency	140
<i>McDonald's Key Generative AI Use Cases</i>	140
DISCUSSIONS AND IMPLICATIONS	142
CONCLUSION	144
REFERENCES	144

CHAPTER 8 AI ETHICS IN RETAIL: INNOVATIONS, CHALLENGES, AND GOVERNANCE	149
<i>Ashwaria Mahajan and Sunil Kumar</i>	
INTRODUCTION	149
RESEARCH METHODOLOGY	152
ARTIFICIAL INTELLIGENCE, ETHICS, AND RETAIL	152
ETHICAL AND PRIVACY CONCERNS OF GENERATIVE AI IN THE RETAIL SECTOR	153
AI GOVERNANCE MECHANISM	154
RETAIL ORGANIZATIONS ADOPTING GENERATIVE AI	155
AI-DRIVEN INNOVATIONS IN RETAIL	155
Computer Vision	155
Sentiment Analysis	155
Predictive Maintenance	156
BEST PRACTICES OF GENERATIVE AI IN RETAIL	156
OPPORTUNITIES WITH GENERATIVE AI	156
CHALLENGES WITH GENERATIVE AI	157
MITIGATION STRATEGIES	158
FUTURE TRENDS OF GENERATIVE AI FOR RETAIL	159
IMPLICATIONS	159
CONCLUSION	160
CONSENT FOR PUBLICATION	160
REFERENCES	160
CHAPTER 9 CONSUMER ACCEPTANCE OF AI-GENERATED CONTENT IN E-COMMERCE	164
<i>Ankur Kumar, Yograj Bisht, Rohit Bansal and Priya Bhatnagar</i>	
INTRODUCTION	164
Motivation	164
Challenges	165
Gaps and Chapter Contribution	166
UNDERSTANDING AI-GENERATED CONTENT IN E-COMMERCE	166
Types of AI-Generated Content	166
<i>Textual Content</i>	167
<i>Visual Content</i>	167
<i>Audio and Voice Content in the E-Commerce Landscape</i>	168
Applications and Benefits	168
<i>Efficiency and Scalability: Automated Content Creation</i>	168
<i>Personalization at Scale: Real-Time Content Customization</i>	169
<i>Consistency and Optimization: Uniform Brand Voice and A/B Testing</i>	169
Case Studies and Industry Insights	170
<i>Stitch Fix</i>	170
<i>Alibaba</i>	170
<i>The North Face</i>	170
Ethical Considerations and Challenges	170
The Future of AI-Generated Content in E-Commerce	171
THEORETICAL FRAMEWORKS ON TECHNOLOGY AND CONTENT ACCEPTANCE	171
Technology Acceptance Model (TAM)	171
<i>Perceived Usefulness and Ease of Use</i>	171
<i>Adaptation of TAM to AI-generated Content</i>	172
Unified Theory of Acceptance and Use of Technology (UTAUT)	172

<i>Performance and Effort Expectancy</i>	172
<i>Social Influence and Facilitating Conditions</i>	173
Consumer Trust and Perceived Authenticity	173
<i>Consumer Trust</i>	173
<i>Perceived Authenticity</i>	173
<i>Integration of Trust and Authenticity into Technology Acceptance</i>	173
FACTORS INFLUENCING CONSUMER ACCEPTANCE	174
Demographics and Digital Literacy	174
<i>Age, Education, and Familiarity with Technology</i>	174
Transparency and Disclosure	175
<i>Explicitly Stating that Content is AI-generated</i>	175
Content Quality and Relevance	175
<i>Natural Language Tone, Emotional Intelligence, Factual Correctness</i>	175
Privacy and Data Security	176
<i>Comfort Level with AI Analyzing Personal Data</i>	176
CASE STUDIES AND SURVEY INSIGHTS	176
Amazon and AI-Generated Product Recommendations	176
<i>Case Study Overview</i>	176
<i>Impact on Consumer Acceptance</i>	177
<i>Lessons Learned</i>	177
ChatGPT in Shopify Stores for Customer Engagement	177
<i>Case Study Overview</i>	177
<i>Impact on Consumer Acceptance</i>	177
<i>Lessons Learned</i>	177
VisualAI in Fashion Retail for Personalized Styling	178
<i>Case Study Overview</i>	178
<i>Impact on Consumer Acceptance</i>	178
<i>Lessons Learned</i>	178
CHALLENGES AND ETHICAL CONSIDERATIONS	178
Deepfake Risks and Misinformation	178
Mitigation Strategies	179
Bias in AI Training Datasets	179
Mitigation Strategies	179
Regulatory Frameworks and User Consent	179
Importance of Informed Consent	180
FUTURE OUTLOOK AND STRATEGIC RECOMMENDATIONS	180
Transparency Protocols and Labels	180
<i>Establishing Clear Disclosure Standards</i>	180
<i>Impact of Transparency</i>	180
Consumer Education and Digital Literacy Campaigns	181
<i>Empowering Users Through Education</i>	181
<i>Combating Misinformation and Bias</i>	181
<i>Improved AI-Human Collaboration in Content Generation Blending Human</i>	
<i>Creativity with Machine Efficiency</i>	181
<i>Ethical Design of Collaboration Tools</i>	181
CONCLUSION	181
Emphasizing Transparency and Authenticity	182
Ensuring Content Quality and Ethical Standards	182
Fostering Consumer Trust Through Education	182
Strategic Integration of AI-Human Collaboration	183
Survey and Case Study Reflections	183

Future Scope	183
REFERENCES	184
CHAPTER 10 AI IN RETAIL TRAVELING: INNOVATIONS, CHALLENGES AND GOVERNANCE	190
<i>Lavanya Jain, Deepika Gupta, Vaishali Sethi and Chakir Aziza</i>	
INTRODUCTION	191
APPLICATIONS OF GENERATIVE AI IN TRAVEL RETAIL	192
Personalized Product Recommendations in Duty-free Outlets	192
Virtual Try-ons and Smart Interactive Kiosks	192
AI-generated Marketing Content	192
AI-POWERED CUSTOMER EXPERIENCE IN TRAVEL SETTINGS	193
AI-DRIVEN INNOVATIONS IN TRAVEL RETAIL	194
ETHICAL AND PRIVACY CONSIDERATIONS IN TRAVEL RETAIL AI	195
GOVERNANCE MECHANISMS FOR AI IN TRAVEL RETAIL	196
OPPORTUNITIES OF AI IN TRAVEL RETAIL	197
CHALLENGES FACING AI IMPLEMENTATION IN TRAVEL RETAIL	198
SUSTAINABILITY AND ENVIRONMENTAL IMPACT	199
MITIGATION STRATEGIES FOR AI RISKS IN TRAVEL RETAIL	200
FUTURE TRENDS OF AI IN TRAVEL RETAIL	201
CONCLUSION	202
REFERENCES	202
CHAPTER 11 AI AND DIGITAL TECHNOLOGIES-BASED TECHNO-STRATEGIC MODEL FOR THE MALL AND RETAIL INDUSTRY	204
<i>Sandeep Ganpat Kudtarkar</i>	
INTRODUCTION	204
Motivation for the Chapter	205
Challenges of the Topic	206
Significance and Managerial Implications	206
Research Gaps and Chapter Contribution	206
LITERATURE REVIEW	206
Shopping Process in the Mall and Retail	206
ARTIFICIAL INTELLIGENCE AND DIGITAL TECHNOLOGIES	207
AI AND DIGITAL TECHNOLOGIES IN THE INDIAN RETAIL INDUSTRY	208
RESEARCH METHODOLOGY	208
DATA AND DATA ANALYSIS	210
Data	210
Results	213
Hypothesis Testing	214
<i>Hypothesis 1: Using AI and digital technology as tools to grow malls and retailers' revenue can be considered meritorious.</i>	214
<i>Hypothesis 2: The intensive deployment of AI and digital technologies has shown positive feedback on mall customer acquisition rates.</i>	215
FINDINGS AND DISCUSSION	216
TECH STRATEGIC MODEL FOR MALLS	218
CONCLUSION	219
CONSENT FOR PUBLICATION	220
REFERENCES	220
CHAPTER 12 AI-GENERATED VISUALS FOR RETAIL INNOVATION: TRY-ONS, AR, AND DYNAMIC IMAGERY	223

Avtar Singh and Ashish Kumar

INTRODUCTION	224
Motivation: AI-Driven Personalization in Retail	224
Significance: Transforming Retail Practices and Consumer Experience	225
Technical, Ethical, and Operational Barriers	226
Market Trends and Strategic Opportunities	227
Research Gaps in AI-Enabled Retail	228
LITERATURE REVIEW	228
Role of AI in Retail Transformation	228
AI-Driven Technologies: Transforming Consumer Behaviour and Purchase Decisions	229
Technical Challenges and Solutions	229
Comparison Across Industries	230
Ethical and Privacy Concerns	231
DISCUSSION	232
CONCLUSION	232
IMPLICATIONS	233
REFERENCES	236
CHAPTER 13 ENHANCING CUSTOMER RETENTION THROUGH AI-DRIVEN LOYALTY PROGRAMS: A SYSTEMATIC LITERATURE REVIEW	240
<i>Chirra Baburao, Paruchuru Manjushree and M. Venkata Suryanarayana</i>	
INTRODUCTION	240
OBJECTIVES	241
METHODOLOGY	242
LITERATURE REVIEW	242
ARTIFICIAL INTELLIGENCE (AI) IN RETAIL	243
PREDICTIVE ANALYTICS AND CUSTOMER RETENTION	244
AI-DRIVEN LOYALTY PROGRAMS	245
FINDING AND ANALYSIS	245
KEY THEMES	247
ENHANCING CUSTOMER RETENTION THROUGH AI-DRIVEN LOYALTY PROGRAMS	247
PREDICTIVE ANALYTICS: A KEY TO FEATURES-BASED LOYALTY PROGRAMS	248
RESEARCH AND ILLUSTRATIONS	249
CASE STUDIES:	249
DISCUSSION	250
KEY FINDINGS OF THE STUDY:	250
CHALLENGES AND LIMITATIONS	251
CONCLUSION	251
FUTURE RESEARCH DIRECTIONS	252
IMPLICATIONS	252
CONFLICT OF INTEREST	253
FUNDING	253
REFERENCES	253
SUBJECT INDEX	258

FOREWORD

We are living in an era where technology no longer just supports business, it reshapes it. Across industries, few innovations have generated as much excitement, curiosity, and even anxiety as generative AI. For retail, a sector that thrives on understanding customers, anticipating trends, and delivering memorable experiences, generative AI offers a rare opportunity: the ability to reimagine how we create, connect, and compete.

Generative AI for Retail Innovation arrives at a critical moment. Retailers are under increasing pressure to differentiate in an overcrowded, hyper-personalized market. Supply chains need to be more agile, product designs more responsive, marketing more resonant, and customer service more intuitive. Generative AI is no longer just a buzzword — it is the engine powering a new wave of creativity and efficiency.

This book explores how forward-thinking retailers are applying generative AI to tackle real-world challenges: from designing customized products on demand, to generating compelling marketing content at scale, to enhancing in-store and online experiences with conversational AI. It offers not only technical insights but also practical case studies, ethical considerations, and strategic frameworks that leaders can use to drive meaningful innovation. As you turn these pages, you will discover that this is not just a book about technology — it is a book about transformation. It challenges you to rethink what's possible in retail and invites you to embrace a future where human creativity and machine intelligence work hand in hand.

I believe that those who approach generative AI with both curiosity and responsibility will not just keep pace with change — they will shape it. This book will help you become one of those shapers. Whether you are a business leader, technology enthusiast, academic, or student, this book serves as an essential guide to understanding and harnessing the disruptive potential of AI.

Welcome to the frontier of retail innovation. Let's explore it together.

Mostafa Mohammad
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PREFACE

The retail industry stands at the cusp of a revolutionary transformation, propelled by the rapid advancements in Generative Artificial Intelligence (AI). With its unparalleled ability to create personalized content, predict consumer behavior, optimize operations, and redefine customer engagement, generative AI has become a cornerstone of retail innovation. This edited volume, "Generative AI for Retail Innovation," presents a curated collection of scholarly insights and empirical studies that explore the diverse applications, opportunities, and challenges of generative AI in the retail sector.

The chapters in this book address a broad spectrum of themes that reflect the dynamic and evolving role of generative AI in retail. From navigating cultural diversity in AI-driven global marketing to examining the ethical dimensions and opportunities of AI adoption, the book offers critical perspectives on strategic and responsible AI integration. The transformative potential of AI service tools in enhancing customer relationships and loyalty dynamics is discussed through case studies and analytical frameworks.

The role of generative AI in redefining workforce dynamics, particularly in automating and augmenting retail functions, highlights its implications for future workforce strategies. Regional perspectives, such as redefining the retail industry in India through technology integration, add valuable contextual insights to the discourse.

The book delves into the AI-powered transformation of physical retail spaces, exploring how generative AI enhances the in-store shopping experience. Sustainability remains a critical focus, with chapters dedicated to optimizing retail supply chains through AI-driven solutions. Further, the application of generative AI in demand forecasting and inventory management showcases its impact on operational efficiency and agility.

A significant emphasis is placed on personalized customer experiences, driven by AI's capability to analyze vast datasets and generate tailored recommendations. The acceptance of AI-generated content in e-commerce is examined from a consumer behavior perspective, offering insights into trust, engagement, and adoption patterns.

Emerging innovations, such as virtual shopping experiences and augmented reality, powered by generative AI, are explored for their potential to redefine digital retail experiences. The volume also addresses governance challenges and provides an outlook on AI in retail travel, broadening the scope of AI applications within the retail ecosystem.

Bringing together contributions from academia, industry experts, and practitioners, this book serves as a comprehensive resource for understanding the multifaceted impact of generative AI on retail innovation. It is intended for scholars, retail professionals, technology enthusiasts, and policymakers aiming to navigate and leverage AI for sustainable and customer-centric retail growth.

We hope this compilation not only advances academic discourse but also inspires actionable strategies and innovations in the retail industry.

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CHAPTER 1

When AI Meets the Aisles: The Future of Physical Retail

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Abstract: This chapter examines the impact of AI on physical retail, highlighting its role in operations, personalization, and sustainability. By integrating research and expert insights, it analyzes AI's evolving role in brick-and-mortar stores. AI enhances inventory management, customer interaction, and efficiency while raising privacy and adoption concerns. Key gaps include regional variations, scalable personalization, and accessibility for smaller retailers. This chapter outlines AI's historical development and disruptive potential, with insights into established and emerging players driving innovation. Methodologically, it employs secondary research and five expert interviews for a comprehensive overview. Expert interviews reveal that AI adoption varies by industry role, company size, and region. Marketing experts stress AI's benefits for personalization and customer engagement, while tech professionals highlight automation and supply chain advancements. AI improves demand forecasting, real-time tracking, and dynamic pricing, though mid-sized retailers struggle with cost and data limitations. Privacy concerns persist, requiring transparency, opt-in policies, and regulatory compliance. Cultural differences shape AI acceptance and influence consumer trust. Future AI trends include computer vision checkout, AI-driven recommendations, and augmented reality. Retailers must balance automation with human interaction to enhance, not replace, customer experience.

Keywords: Artificial intelligence, AI and retail, Brick-and-mortar stores, Customer experience, Generative AI, Inventory optimization, Machine learning, Personalization algorithms, Retail technology, Retail, Smart retail.

INTRODUCTION

Artificial intelligence (AI) is increasingly shaping the future of physical retail by transforming operations, enhancing customer personalization, and promoting sus-

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tainability. As brick-and-mortar stores adapt to digital transformation, understanding AI's role in retail innovation is both timely and necessary.

Motivation of the Chapter

The motivation for this chapter stems from the rapid integration of AI into physical retail environments. While e-commerce has traditionally led the adoption of AI, physical stores are now embracing these technologies to remain competitive and to enhance consumer experiences through innovative inventory systems, personalized recommendations, and efficient operations.

Challenges of the Topic

Despite its transformative potential, AI adoption in retail presents several challenges. These include accessibility barriers for small and mid-sized retailers, cultural differences in consumer trust and acceptance, high implementation costs, and persistent data privacy concerns. Workforce adaptation and ethical use of consumer data further complicate adoption, particularly in regions with stringent regulations.

Significance and Implications

Understanding AI's role in physical retail is significant for multiple stakeholders, including store owners, technology developers, policymakers, and consumers. Beyond efficiency and profitability, AI adoption also has implications for sustainability, consumer trust, and equitable access to technology. Insights from this study contribute to developing strategies that balance automation with human interaction, thereby enhancing, not replacing, the customer experience.

Research Gaps and Contribution

Previous studies have emphasized AI's potential for efficiency, personalization, and decision-making [1 - 3]. However, key gaps remain, including (a) limited exploration of regional and cultural differences in AI adoption [4], (b) scalability challenges for small retailers [5], and (c) insufficient focus on the privacy–personalization paradox [6]. This chapter addresses these gaps by integrating secondary research with expert interviews, offering a comprehensive perspective on how AI reshapes physical retail.

The primary research question guiding this chapter is: *How is artificial intelligence transforming physical retail, and what opportunities and challenges does it present in enhancing operations, personalization, and sustainability?* To answer this, the chapter (1) examines current applications of AI in retail operations, (2) explores its role in personalization and customer engagement, (3)

identifies barriers to adoption, (4) investigates contributions to sustainability, and (5) highlights emerging trends.

LITERATURE REVIEW

This section discusses the AI landscape of the past, present, and future, as well as the historical evolution of AI in the retail industry. It also explores the current landscape of AI in the retail industry, including major and emerging players.

AI Landscape: Past, Present, and Future

Research on artificial intelligence (AI) in retail currently demonstrates how it affects operations, customer service, and decision-making. Studies by Cao [2] and Oosthuizen *et al.* [1] on how artificial intelligence influences operational efficiency, customer interactions, and inventory control offer instruments for improved application of AI. Predicting new uses and emphasizing its relevance to improving retail operations, Lu *et al.* [3] examined AI's future in this industry.

Notwithstanding developments, there are still gaps in AI research for physical retail, especially in sustainability, consumer uptake, and customisation. Kolar *et al.* [4] underlined the impact of customer views, past experiences, and gender variations. Although scalability is yet to be understudied, Scholdra *et al.* [5] investigated AI-driven personalization that bridges online and offline buying. Alaali [6] showed concerns about its viability for small stores, even as she links artificial intelligence to the aims of sustainable development. Emphasizing issues with data utilization and openness, Canhoto *et al.* [7] explored the personalization-privacy contradiction. These gaps point to the necessity of further study on privacy solutions in artificial intelligence-driven retail, small-business adoption, and regional variations. The historical evolution of artificial intelligence in retail is examined in the next part.

From the consumer standpoint, as Pillarisetty and Mishra [8] noted, artificial intelligence enhances shopping experiences through virtual assistants and tailored recommendations. While Pillai *et al.* [9, 10] examined consumer readiness to embrace artificial intelligence in retail, Moore *et al.* [9] and Petrescu *et al.* [10, 11] explored AI's impact on consumer behavior and privacy issues. These studies, taken together, show how artificial intelligence is changing consumer behavior and brand interactions while raising privacy and trust concerns.

CHAPTER 2

Revolutionizing Retail: How AI is Shaping Personalized Customer Experiences

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Abstract: Generative artificial intelligence (GenAI) alters some basic retail and marketing angles by changing customer personalisation, improving engagement, and changing data-driven analysis with artificial intelligence. The recent introduction of DeepSeek AI, which has now accelerated the trend towards hyper-personalisation, has automated operational efficiencies. This chapter presents an exposition of the impact of GenAI on retail customer personalisation, showing its major applications, advantages, disadvantages, challenges, and related ethical considerations. Results show that GenAI is relevant for advancing and optimising personalisation in the retail sector, and for it to be responsibly embraced and used, major operational issues need to be addressed, including data privacy and breaches, algorithmic biases, and ethical dilemmas.

Keywords: Artificial Intelligence (AI), AI strategy in retail, AI-powered marketing, Customer segmentation, Dynamic pricing strategies, Innovations in retail, Machine learning applications in retail, Omni-channel retailing, Predictive modelling analytics, Tailored customer experiences.

INTRODUCTION

With rapid advances in generative artificial intelligence (GenAI), the retail sector is undergoing an unprecedented transformation in the dynamic lifestyles of consumers, giving rise to dynamic, hyper-personalized experiences, altering customer approach with brands from traditional automating tools [1, 2]. This is how this technological evolution shapes the very core of the retail landscape: predictive analytics, real-time customer engagement, intelligent pricing strategies, and frictionless omnichannel experiences [3].

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The emergence of synergy platforms, starting with DeepSeek AI, that leverage multimodal proofs with high-end deep learning algorithms, signals a leap toward a future where customer expectations will not just be met but anticipated [4]. Retailers using GenAI have achieved advances in customer loyalty, operational efficiency, and market agility [5]. Deep analysis of behavior patterns, sentiments, and purchase histories enables such systems to offer personalized journeys that make customers feel unique, understood, valued, and connected to the brand's offerings [6].

However, even while promising phenomenal potential, GenAI introduces new challenges related to data privacy, algorithmic bias, transparency, and ethical use [7]. In an increasingly data-driven world, where retailers are becoming dependent on extensive, structured and unstructured data for customers in building their business, compliance with the different regulatory frameworks, such as the General Data Protection Regulation (GDPR) and California Consumer Privacy Act (CCPA), becomes indispensable to foster trust and a taintless brand reputation [8]. Interpretability and accountability for algorithmic decisions are necessary to counter potential institutional biases against specific consumers [9].

The future belongs to retailers that manage to integrate GenAI responsibly, striking the right balance between promoting innovation and ethical stewardship. AI-induced hyper-personalization is not a fleeting trend but rather a strategic imperative that will affect competitive dynamics in the retail sector for many years to come [10]. Those that will hold sway in the next era of retail excellence will be those that have embraced the transformative power of AI while embedding values of transparency, fairness, and customer centricity into their operating models.

This chapter critically explores how GenAI, especially innovations, such as DeepSeek AI, is revolutionizing customer personalization in retail and discusses the challenges, ethical issues, and the path forward for responsible, sustainable AI adoption.

LITERATURE REVIEW

There are many advantages of artificial intelligence (AI) in the retail sector. AI is a system's ability to gather and interpret information, learn from it, and apply this to specific tasks or achieve outcomes through adaptive behavior. Subfields of this discipline range from machine learning (which involves supervised, unsupervised, and semi-supervised algorithms) to deep learning, which uses artificial neural network methodologies to address complex learning challenges [11, 12]. Learning algorithms, such as artificial neural networks, Bayesian networks, genetic algorithms, k-nearest neighbors, and support vector machines, combine

sophisticated processing capabilities to perform tasks, such as association, classification, grouping, and regression, by analyzing enormous datasets [13]. Deep Neural Networks are multi-functional machine learning applications that leverage advanced capabilities, cloud computing, the Internet of Things, and big data, enabling general-purpose machine learning (GPML) to work with various data types (video, audio, text) and thus improve the accuracy of forecasting product demand through customer behavior analysis. Additionally, GPML technology and some attributes of digital platforms have been leveraged by small retail businesses to increase IT visibility and global reach for their operations [14, 15]. Generative artificial intelligence is seeping into retail marketing, improving and facilitating customer interactions, experiences, and business operations. Its result is buttressed by key contributions from elite institutions and authorities.

One of the foremost scholars driving this investigation into AI's impacts and developments is Dr. Kim Oosthuizen, who has made very thorough research developments regarding the offerings of such an application in retail and marketing under publication titled “Artificial Intelligence in Retail: The AI-Enabled Value Chain,” where she introduces and studies an all-inclusive framework of 8 central imperatives that retailers should carefully consider and evaluate while adopting AI technology practices. This strategic model offers an integrated perspective that covers personnel and organizational tasks, technology, and structural considerations for effective AI integration into retail business operations.

The retail industry will now be conditioned by generative AI to an extremely high level of hyper-personalization, which will yield more profound insights into customer behavior, allowing retailers to understand not only what customers want but also predict tastes and preferences with far greater accuracy and predictability. GenAI-like businesses offer personalized shopping experiences that improve customer satisfaction and foster lifelong loyalty [16].

While considering the possibility of using large amounts of data and customer knowledge, this aspect offers significant gains but also creates a certain burden owing to an ethical approach to data privacy. A balanced differentiation between personalization and curation, and the ethical use of customer data, has become a major issue, as several studies show that 56% of customers are more willing to return to stores that offer such personalized, tailored experiences. Therefore, retailers should adopt AI technologies that maintain high levels of privacy, encryption, and security to protect customer privacy and security, rather than optimizing to enhance the customer experience [17 - 19].

CHAPTER 3

AI Service Tools: The Next Phase for Retail's Customer Relationship

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Abstract: AI service tools have drastically changed the retail industry by making it a reality to tailor experiences for every customer. This chapter aims to shed light on how new technologies of AI, like advanced algorithms and large language models, have improved customer engagement. Retailers are nowadays using AI tools for suggesting products to customers and creating flexible marketing campaigns, which will improve customer experience in both online and offline stores. Analyzing large amounts of data and applying predictive methods, AI will be instrumental in helping businesses understand customer preferences, predict future purchases, and provide quick, customized solutions to consumer problems. However, we cannot overlook the privacy and ethical concerns associated with the use of AI service tools [1], so it is crucial to develop a transparent and secure system for customers. This chapter includes instances from well-established retail brands that have triumphantly utilized AI tools to augment the loyalty and satisfaction of customers. In addition to this, it outlines the effective strategies and future trends for leveraging AI to initiate more personalized and better shopping experiences.

Keywords: AI service tools, Customer relationship, Generative AI, Personalization, PRISMA framework, Retention of customers, Satisfaction of customers.

INTRODUCTION

The retail sector is going through a profound transformation due to the powerful influence of AI service tools, which have redefined the ways of interacting with customers and developing relationships with customers through social media, but at the same time, we cannot ignore the privacy and ethical concerns related to AI [1 - 3]. In this new era of digitalization, companies are not only incorporating sophisticated AI service tools but also harnessing generative technologies for craf-

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ting customer personalized experiences, which is truly genuine and authentic [4]. Owing to the ability to generate human-like text, images, and conversations, AI service tools are setting new standards to revolutionize customer engagement in the retail sector. The advancements in AI tools are transforming the retail industry rapidly. As retailers are rapidly adopting AI, it has changed the way they interact with customers and develop relationships across digital channels. Major adoption is of AI solutions, such as chatbots, generative content tools, and AI-based recommendation systems. Thus, this chapter explores how innovations impact the next phase of retail customer relationships and how retailers manage these relationships.

A major challenge in these areas is balancing the efficiency of personalisation with the use of AI and the privacy concerns of customers. AI surely generated human-like content and helps to customize as per each customer's needs; at the same time, it has given rise to new complexities, such as managing ethics in business operations. Many businesses have a hard time adopting and successfully leveraging AI while still providing human touchpoints.

The significance of delving into AI within the retail landscape arises from its profound implications: astutely harnessing AI empowers retailers to uncover richer insights into consumer preferences, foresee future behaviours, and curate personalized experiences on an expansive scale. These innovations can enhance customer loyalty, boost revenue, and promote sustainable growth for businesses. Nonetheless, these advantages can only be harnessed if retailers confront ethical and practical challenges by promoting transparency, ensuring data protection, and crafting AI systems that are inclusive and culturally aware.

Recent studies and real-world applications reveal various shortcomings. Much existing research tends to deliver general summaries rather than thorough examinations of operational difficulties and their remedies. Ethical dilemmas such as excessive dependence on automation, diminished authenticity, and varying levels of customer acceptance are also inadequately investigated. This chapter seeks to fill these gaps by integrating insights on the revolutionary influence of AI technologies in retail and proposing avenues for future research exploration.

By addressing these crucial elements, this chapter offers a thorough roadmap for scholars and industry professionals keen on utilizing AI to enhance customer connections in retail while ensuring trust, inclusivity, and enduring value.

This chapter explains how generative AI is mending its ways for interaction with customers. It encompasses all the advantages and challenges of using the AI tools and covers the ethical problems associated with its implementation, so that trust of customers should be built in it by keeping the interactions genuine [1, 5].

THE EVOLUTION OF AI SERVICE TOOLS IN RETAIL

The retail sector has steadily changed with ongoing technological advancements. The things that were all done manually have now been handled by AI tools, which have enhanced the customer experiences and made daily tasks smoother. AI tools represent a major milestone in this era of evolution and are considered the fifth stage of digitalization [6]. In the initial stages, the focus was on converting data into digital formats, establishing communication channels, and enhancing operational efficiency. However, the scenario has now changed, with AI service tools utilizing artificial intelligence for content creation. This transformation has fundamentally altered the way enterprises interact and engage with customers by changing customer relationships and creating opportunities for personalization, improving efficiency and innovation [7, 8].

Realistic Content Creation

The most impressive characteristic of AI service tools is their capability to design content that exactly mirrors human-generated content [9, 10]. By applying modern methods like transformer structures and neural networks, AI can produce high-quality text, images, audio, and even live visuals. In the retail sector, this ability is used in the following ways:

Product Descriptions

Retailers can make use of AI to generate engaging and SEO-optimized descriptions for their products [4]. For instance, an AI tool could give the description of features of products along with the customer reviews so that it can provide a personal touch to their diverse audiences.

Visual Content

AI tools, like DALL-E, have the competence to generate realistic images of products, which will allow retailers to customize designs and show how the product looks in various environments, as per the wishes of the customer, like furniture in a customer's living room or apparel on specific body shapes.

Video Campaigns

AI service tools can also produce promotional videos that will target a specific segment of customers, which will save enough resources and time and will pave the way for a higher degree of creativity in marketing efforts.

This level of realism enhances customer engagement by supplying consumers with personalised content. Furthermore, it reduces the burden of creative teams,

CHAPTER 4

Transforming Customer Loyalty Dynamics Using AI Technologies

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Abstract: The rapid development of Generative Artificial Intelligence (AI) is reshaping the retail industry by creating new opportunities for personalized customer engagement. This chapter explores how advanced technologies, including large language models, improve customer interactions through a generative AI-driven approach, enabling highly customized experiences. It further explores the role of AI in customizing product suggestions, developing tailored advertising, and managing customer engagements in the offline and online worlds. With AI tools, it is possible to assess the innovativeness of customers to reduce the risk of new product failure. This chapter also highlights the challenges of deploying AI systems by focusing on issues, such as personalization and privacy, beyond the retail context. Leading retail brands are also studied to demonstrate how these transformations of generative AI can increase Customer Loyalty (CL), improve retention rates, and enhance satisfaction. Finally, the chapter demonstrates which practices are current trends in AI for providing personal assistance to customers, thereby enhancing their loyalty in the future retail environment.

Keywords: Artificial intelligence (AI), Customer innovativeness, Customer loyalty (CL), PRISMA framework, Retention of customers.

INTRODUCTION

The rapid advancements in Artificial Intelligence (AI) technologies are reshaping the landscape of customer loyalty, particularly in the context of Intelligent Personal Assistants (IPAs). As customer loyalty has become a critical element for gaining a competitive advantage, understanding the factors that influence it is essential. Customer loyalty is the customer's preference for and insistence on a specific product, which includes both behavioral and attitudinal dimensions. This

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means that loyalty is not just about repeat purchases but also involves a psychological attachment to the service provider. The previous research findings clearly indicate that enhancing perceived value through AI can significantly improve customer loyalty, providing valuable insights for businesses aiming to optimize their strategies in the intelligent personal assistant industry [1]. Along with IPA, AI chatbots and machine learning models make customer support activities more efficient and effective, thereby increasing customer loyalty [2]. The inspiration for this chapter comes from the growing reliance of companies on AI-based technologies to maintain customers within fiercely competitive markets. Studies indicate that AI-powered personalization strengthens both attitudinal and behavioral loyalty by creating more profound brand relationships [3, 4]. Furthermore, in the realm of e-commerce and financial institutions, AI-based solutions have been shown to enhance efficiency, minimize churn, and improve customer interaction [5, 6]. Therefore, this chapter is motivated by the need to explore AI's transformative role in redefining customer loyalty strategies through personalized, predictive, and emotionally intelligent interactions. Customer loyalty is primarily influenced by customer innovativeness and perceived value. However, some green customers feel that they are not receiving adequate support from AI chatbots, which undermines the service quality management systems of organizations [7]. Though it has a transformative potential, the deployment of AI technologies is quite challenging. Major impediments are the risks to data privacy and security, AI algorithm opaqueness, and opposition from customers and employees alike [7]. Huge integration costs, poor training, and chatbot limitations in grasping customer emotions tend to demote loyalty initiatives [8]. Moreover, customers who seek human interaction may find AI-based interactions less satisfactory, thereby negatively affecting service quality and loyalty [9]. Adoption is further complicated by concerns about algorithmic bias, misuse of customer information, and trust [10]. According to this research, AI technologies have the potential to revolutionize customer loyalty management by enabling businesses to build stronger relationships through emotional connections and data-driven personalization [11]. The effects on businesses are far-reaching; AI technologies provide a sustainable competitive advantage, reduce retention costs, and boost customer lifetime value [12].

Furthermore, AI-powered customer experiences foster advocacy and brand love, both of which are essential for long-term profitability and retention [6, 13]. Customers receive more personalized experiences from artificial intelligence marketing as AI analyzes data to identify patterns and preferences. Consequently, this helps keep clients [7]. As a result, this chapter assessed how AI tools affect the provision of personalized and customized experiences. It also investigated how well AI tools perform in increasing overall customer lifetime value and proactively retaining customers. Businesses can use AI technologies to improve

customer experiences, tailor marketing campaigns, and analyze consumer behaviour.

By leveraging AI, companies can better understand customer needs and preferences, leading to stronger emotional connections and increased loyalty. This chapter examined how insights powered by AI can revolutionize consumer interactions and foster enduring loyalty across a range of sectors [14]. Even though there is research on the application of AI in marketing and service delivery, there are clear gaps in the framework that attempts to combine the positive outcomes and the difficulties of adopting AI. More specifically, less research examines how AI simultaneously fosters creativity and personalization while posing problems, such as job uncertainty and privacy threats [15, 16]. Similarly, cross-industry analysis of AI-based loyalty strategies has received less attention in the literature, particularly in developing nations [6]. Moreover, this chapter also covers the obstacles that businesses encounter when integrating AI tools into various marketing strategies, and the different ways that these obstacles can be overcome. By methodically synthesizing research on AI-powered loyalty strategies across industries such as retail, banking, and hospitality, this chapter aims to close research gaps. This chapter discusses the risks associated with AI, offers ways to reduce them, and highlights the opportunities it presents for customer experience and personalized enhancement. This chapter adds to academic research and business practice by combining findings from multiple industries to give a global understanding of AI's role in customer loyalty.

ROLE OF AI TECHNOLOGIES IN INCREASING RETENTION OF CUSTOMERS AND IMPROVING CUSTOMER LOYALTY

Giving Recommendations to Customers

The artificial intelligence marketing framework uses a notion called "k-bridge" that connects the customers to the overlapping sub-networks. Using this approach enables the recommendation of businesses and products relevant to current customers, leading to increased customer engagement and loyalty [7]. AI tools help in analyzing customers and in identifying customer preferences, so that AI tools will guide customers in the future as per their preferences. AI tools and augmented reality apps are designed with AI. Augmented reality apps provide an entertaining experience for customers and offer essential support by offering recommendations to make their shopping easier and more effective. AI not only provides product recommendations but also offers suggestions related to customer service. For example, Netflix uses a simpler form of AI to recommend movies to users, while Amazon's virtual assistant, Alexa, utilizes a more complex form of AI [3]. The extensive data collected by companies through AI tools enables a

CHAPTER 5

The Role of Generative AI in Redefining Retail Workforce Dynamics: An Empirical Analysis

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Abstract: This study investigates the role of generative AI in transforming workforce dynamics within the retail sector, focusing on its impact on productivity, employee roles, and customer interaction. Using a mixed-methods approach, including surveys, interviews with retail employees and managers, and secondary data analysis, the research explores the effect of AI on workforce efficiency. Findings demonstrated that generative AI automates routine tasks, such as inventory management and customer service, allowing employees to engage in more strategic, creative activities. AI integration also redefines job roles, creating demand for AI specialists and necessitating upskilling for existing workers. However, challenges, such as resistance to AI adoption and concerns over job displacement, remain significant. This chapter highlights the need for a human-centered approach to AI integration in retail, advocating for comprehensive workforce training and inclusive change management strategies. By leveraging AI strategically, retail businesses can enhance employee productivity and satisfaction and foster innovation within an increasingly automated environment.

Keywords: AI integration, Automation, Change management, Customer service, Customer interaction, Employee engagement, Employee roles, Generative AI, Human-centered approach, Inventory management.

INTRODUCTION

Background

Generative Artificial Intelligence has emerged as a valuable tool in the retail industry, utilising machine learning models to generate new, data-driven content and automate strenuous activities [1]. Unlike traditional AI, which follows predefined rules and patterns to perform specific tasks, generative AI uses neural networks to generate outputs, such as text, images, or recommendations, by anal-

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yzing massive amounts of data [2]. In the retail context, generative AI applications are transforming several facets of operations, from customer service automation with AI-driven chatbots [3] to inventory management and personalized marketing [4].

AI technologies can improve workforce productivity by streamlining repetitive tasks, delivering key insights, and enhancing employee support in their roles [5]. However, this integration is reshaping how retail employees interact with technology and their work environment. Generative AI's ability to manage repetitive tasks, such as data entry, scheduling, and customer inquiries [6], allows employees to focus on complex tasks that require human ingenuity and decision-making. Despite the promising benefits of generative AI, there is limited research exploring how it impacts employee productivity, job satisfaction, and the evolution of workforce structures in retail [7].

Problem Statement

The retail industry has been facing several challenges, including high employee turnover, skill gaps, and the need to continually adapt to customer demands. Manual procedures in traditional workforce models have been unable to address the issues at hand. Retail companies are increasingly resorting to automation to enhance operational efficiency as well as address shifting consumer needs [8]. Generative AI, as an epitome of automation, has the greatest potential to change how retail workers perform their work. Nonetheless, the application of AI technologies in retail operations raises new issues regarding the management of employees, positions, and overall employee satisfaction.

There is a promise of value to be unlocked with AI across business processes, but the emerging aspects of organizational behavior that affect the workforce remain unexplored [9]. The potential of generative AI to perform monotonous tasks might reduce employees' workload, but it also raises questions about increased unemployment, changes in the workforce, and the demand for different types of employees [10]. There is therefore a need for more evidence on how generative AI affects changes in organizational structure and dynamics in retail, including productivity, skill acquisition, and evolving employee responsibilities [11].

Research Questions

This study aims to explore the following research questions:

- How does generative AI affect employee productivity in retail environments?
 - This question seeks to assess the influence of AI-driven tools on employee productivity in domains, such as customer service, inventory management, and administrative tasks.
- What role does generative AI play in employee training and skill development?
 - This question examines how generative AI enhances training programs and helps employees develop new skills, such as data analysis and AI tool use, to adapt to technological changes.
- In what ways is the structure of the retail workforce changing with the adoption of generative AI?
 - Examining shifts in job responsibilities, the emergence of AI-related roles, and the transformation of traditional positions within the retail workforce.
- What are the challenges and barriers to implementing generative AI in retail workforce automation?
 - This question focuses on identifying obstacles, such as employee resistance, technological limitations, and the high costs of AI implementation.
- What impact does AI-driven automation have on employee job satisfaction and engagement?
 - Exploring the effects of AI on employee morale, work-life balance, and engagement, especially regarding the perceived threat of job displacement.

Objectives

This study intends to fulfill the following goals:

- To analyze the effects generative AI has on retail business employees' productivity by comparing various performance indicators before and after the implementation of AI tools.
- To examine the influence of generative AI on an employee's training and skill mastery, with particular emphasis on how easily a given employee can learn to operate given technologies.
- To study the changes in a retail employee's market, including changes in responsibilities and the emerging requirements for new skills that come with the adoption of AI.
- To establish the reasons why generative AI is not embraced in the management of the retail workforce, with particular focus on the technology and the factors that influence successful implementation.
- To investigate the impact of CAI on employees regarding their satisfaction and overall engagement in their work, with particular emphasis on job security and the changing scope of employment in retail.

CHAPTER 6

Redefining the Retail Industry in India Through Technology Integration

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Abstract: The retail industry in India is experiencing a distinctive shift propelled by technological disruption, changing customer behavior, and innovations reinventing the retail experience. Technology propels the advancement of the e-commerce sector. This period emphasizes personalized services, immersive consumer experiences, and robust commitments to sustainability across all endeavors. E-commerce will perpetually evolve with technological advancements, fundamentally transforming the industry. Augmented Reality (AR) enhances online shopping engagement, while Artificial Intelligence (AI) personalizes customer recommendations, streamlining the purchasing experience. It is a transformation aimed at fundamentally redefining the shopping experience through cultivating relationships, providing value, and establishing trust between enterprises and consumers. Digital expansion can accelerate once e-commerce assumes a more prominent role in FMCG purchasing, as digital marketing combined with e-commerce can facilitate the conversion of ad views into sales with a single click. In the age of experiences, where the demand for authentic and enduring journeys continues to escalate, harnessing the potential of immersive brand experiences is more essential for sustaining relevance and competitiveness in the marketplace. This chapter offers insights into contemporary trends and techniques organizations employ to maintain a competitive edge and enhance their market position.

Keywords: E-commerce, Experience, Retail, Technology.

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INTRODUCTION

India's retail industry is undergoing a unique transformation driven by technological disruption, evolving consumer behaviors, and new innovators redefining the retail experience. Technology is the driving force propelling the e-commerce industry forward [1]. This era is characterized by customized services, engaging customer experiences, and strong commitments toward sustainability in all activities. Shopping through e-commerce will continuously evolve with changing times as technology progresses, reshaping the foundations of this industry. Augmented Reality (AR) makes online shopping more immersive, while Artificial Intelligence (AI) tailors customer recommendations, enhancing the buying experience (BX) [2]. This revolution is based on completely reshaping shopping into a relationship-building, value-delivering, and trust-enhancing experience between businesses and consumers. The growth of digital commerce can accelerate significantly once e-commerce starts playing a bigger role in FMCG buying, since digital marketing, combined with e-commerce, can seamlessly link ad views to sales with just a click of a button. In the age of experiences, where the demand for genuine and enduring journeys is increasing, adopting immersive brand experiences is essential for sustaining relevance and competitiveness in the marketplace. This chapter offers critical insights into contemporary trends and techniques firms implement to maintain a competitive edge and enhance their market position [3]. Despite significant transformations in the retail landscape, shopping malls continue to play a crucial role [4]. The digital revolution has pushed malls to redefine their purpose in people's lives. The e-commerce industry will negatively impact shopping malls if online stores offer more significant discounts or price differences, and malls fail to evolve into destinations offering consumers unique experiences. E-commerce has undoubtedly created a significant disruption, providing consumers with an alternative shopping avenue where goods are conveniently delivered to their doorsteps [5].

It is crucial to note that Generation Z already constitutes 50% of the global population and is projected to represent 27% of the workforce by 2025. While Gen Z grew up online, Gen Alpha is growing up in increasingly immersive, platform-based digital environments, including early metaverse-like spaces, where avatars and interactive experiences play a central role [6]. Technology has been a disruptor across sectors, from the early days of Microsoft, Google, and Apple to new-age companies like Facebook, Uber, and restaurant chains like McDonald's, Domino's, and KFC, which have transformed the way brands interact with customers. The new retail landscape includes concepts like "Click-and-Pick," "Dark Stores," and "Dot Com Stores," collectively known as Quick Commerce, which is revolutionizing the e-commerce industry. Today, consumer expectations

vary across different generations, including Baby Boomers, Generation X, Millennials, and Generation Z. According to the *Retail 4.0 India Story: Unlocking Value Through Online + Offline Collaborations* by Technopak and NASSCOM, Indian retail evolution spans three significant eras of transformation: (a) Up to 1999 – *Retail 1.0*: Dominated by neighborhood *kiranas* (small local grocery stores), (b) 2000-2006 – *Retail 2.0*: The rise of modern retail formats, and (c) 2007-2020 – *Retail 3.0*: Online-led retail growth, driven by the technology-led integration of India's largely fragmented retail ecosystem [7].

Retail 4.0 is emerging as a convergence of offline and online (*O+O*) retail, creating a digitally enabled ecosystem where technological solutions and digital-savvy customers play an active role [8].

Meanwhile, in India's 2D internet world, a refreshing new wave of direct-to-consumer (D2C) brands is challenging established players. *Brand-starved Bharat* is rapidly embracing digital-first consumer brands across diverse sectors, such as beauty, electronics, healthcare, pet care, fresh meat, and chocolates. Brands like *MyGlam*, *Mamaearth*, *Bewakoof*, and *Sleepy Owl* are making a significant impact [9]. The *Metaverse* is a virtual 3D immersive world where people interact through digital avatars, replicating physical experiences using immersive technologies like Augmented Reality (AR) and Virtual Reality (VR). Consumers can now buy a “Gucci” outfit from the brand’s Metaverse store and showcase it digitally at live events. “Tanishq” launched its bridal collection *Rivaah* in the Metaverse, allowing participants to try out pieces in the *Rivaahverse* using QR codes. Similarly, Mahindra's *Dealerverse*, built using cutting-edge technology, will allow buyers to visit a virtual dealership, interact with sales staff, and even purchase a car within the Metaverse [10].

Adopting contactless payment methods has helped improve the speed and efficiency of transactions. Many brands have mobile applications to allow customers to browse menus, place orders, and make payments through their smartphones. Self-service kiosks enable customers to place orders and make payments independently. These kiosks have user-friendly interfaces and help streamline the ordering process [11]. D2C brands have fine tech adoption beyond the product, and good D2C brands have found a thoughtful way to personalize the shopping experience for consumers by using customers' preview shopping, search, and browsing history to track how people navigate their websites [12]. The adoption of tech will become intense and sophisticated over the coming days as more and more D2C brands enter the industry and improve the shopping experience for the consumer [13].

CHAPTER 7

Navigating Cultural Diversity in Generative AI-Driven Retail Marketing: A Cross-Cultural Investigation

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Abstract: With the advancement of AI technologies, Generative AI (Gen AI) is becoming a crucial tool for retail marketing due to its capacity to produce data-driven, tailored content creation that presents firms with previously unheard-of chances of interacting with customers. The varied cultural backgrounds of customers around the world, however, present a serious obstacle to ensuring that AI-driven marketing tactics are successful and sensitive to cultural differences. The present study examines how Gen AI technologies can be used by marketers to appeal to a variety of cultural contexts while avoiding pitfalls that could arise from different interpretations across cultures. By analyzing the linkage between Gen AI and cultural diversity, this study provides guidance on how companies can effectively negotiate the intricacies of international marketplaces while promoting inclusivity and relevance of their marketing campaigns. The present study explores the usage of Gen AI by examining global cases of cultural variation in consumer behavior based on the case studies of two of the global giants, Amazon and McDonald's. The research aims to shed light on the opportunities and pitfalls of using Gen AI to craft marketing strategies that resonate across different cultural landscapes.

Keywords: AI-driven marketing, Amazon, Cultural diversity, Case studies, Generative AI (Gen AI), McDonald's.

INTRODUCTION

In an increasingly globalized world, the convergence of technology and culture has become a crucial factor in determining contemporary business strategies. This is also true for retail marketing, particularly when Gen AI is used. Gen AI has emerged as a major component of the current paradigm shifts in digital marketing,

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which have been primarily driven by technology innovation [1]. The next step in the development of conventional artificial intelligence is generative artificial intelligence, which is now the latest term in technology that can produce original texts, graphics, music, 3D designs, and code, that can have a significant impact on the operations, business plans, and customer interactions of numerous sectors [2].

A subfield of artificial intelligence known as “generative AI” is capable of producing original text, image, or music that is more similar to human artistry [3]. Some of the applications of Gen AI include text writing, realistic visual art and photography, production of video and animations, and original music composition [4]. Additionally, the expanding use of Gen AI in sectors like healthcare, finance, and manufacturing serves as examples of how revolutionary it can be in fostering innovation and resolving real-world issues [5].

However, the rapid adoption of Gen AI across many industries presents unique challenges, particularly for businesses that are without technical infrastructure and requisite human capital, as these are essential elements required to reap full advantages from Gen AI advancements [6]. One of the significant risks associated with Gen AI is the regulation of AI-generated content. Businesses using these technologies need to thoroughly test them to determine their most suitable use cases [7].

There is no denial of the growing influence of emerging Gen AI over marketing [8]. Due to its substantial potential for business process automation, customisation, and optimization, Gen AI is emerging as a very promising technology leading towards digital transformation [9]. As one of the most powerful AI tools that is currently available in the market, Gen AI has the potential to totally revolutionize digital marketing campaigns [10]. With the recent development in Gen AI technologies, marketers can now avail themselves of services like ChatGPT to manage some parts of their content creation process. This change is beginning to give marketers greater tools for personalisation and content production [11].

In addition to automating inventory management, Gen AI and 3D image processing algorithms, ambient scene detection and virtual navigation tools, haptic and multisensory technologies can also create smooth and engaging 3D metaverse customer experiences, encourage brand loyalty, recommend complementary items based on preferences, provide predictive insights, and accurately forecast demand—all of which can be used to configure expectations, values, and personalised emotional significance related to a brand [12]. Knowing the cultural factors that influence consumer behavior is more important than ever as the retail sector uses Gen AI technologies to improve marketing campaigns.

Businesses' interactions with their clients have changed significantly as a result of the incorporation of artificial intelligence (AI) into marketing communication tactics [13]. Gen AI enables the real-time analysis of massive data sets to identify trends, forecast customer behavior, and optimize marketing strategies. By utilizing Gen AI technologies, marketers may improve their return on investment (ROI), make wiser decisions, and reduce inefficiencies [14]. However, incorporating Gen AI has drawbacks mostly related to ethical issues like bias in AI systems and data privacy, which need to be carefully managed to ensure responsible use of Gen AI technologies, as well as substantial human resources are required for Gen AI operations [15]. Furthermore, using Gen AI in business effectively requires more than just putting new technologies into place; it also requires strategically integrating it to maximise its benefits [16].

In order to offer insights on how to best optimise AI-driven marketing strategies for a global audience, the current study uses a case study methodology to investigate how Gen AI may reflect and adjust to a range of cultural values and preferences. In order to identify effective tactics for addressing the difficulties of modern retail marketing, the present study examines how culture, customer interaction, and technology interact through a cross-cultural lens.

LITERATURE REVIEW

In this section, an overview is presented of the previous literature dealing with the Gen AI concept, its relationship with digital marketing theories, its uses in business and marketing, its technology integration across cultures, and the drawbacks of using Gen AI.

A branch of artificial intelligence known as “Generative AI” is dedicated to producing material on its own [10]. Generative AI (Gen AI) is a leading technology in producing novel, creative content, in contrast to traditional AI, which is excellent at automating procedures and analysing data, and Gen AI is exceptionally close to human intelligence; it can mimic human behaviour, think logically, and make decisions [2].

In the present techno-global scenario, the future of marketing is being shaped by Gen AI. Gen AI plays an important role in marketing processes such as market research, audience engagement and interactions, content production, personalisation, and STP strategy (segmentation, targeting, positioning) [2]. There are plenty of previous studies conducted to examine the role of Gen AI in marketing strategies. Smith and Hutson [17, 18] opined that Gen AI, in particular, not only improves scalability and efficiency but also democratises access to advanced marketing technologies, enabling even tiny enterprises and individual producers to carry out successful marketing campaigns without a lot of money or

CHAPTER 8

AI Ethics in Retail: Innovations, Challenges, and Governance**Ashwaria Mahajan^{1,*} and Sunil Kumar¹**¹ *Department of Commerce, University of Jammu, Jammu, Jammu and Kashmir, India*

Abstract: As the paradigm of the retail industry has undergone a significant transformation with the development of digitalization, the integration of Generative Artificial Intelligence (GAI), deep learning, and machine learning models has emerged as a potential driver that reshapes the functioning of the retail sector. The advancement of Artificial Intelligence (AI) has provided numerous opportunities to businesses, such as improving customer experience, gaining a competitive advantage, and streamlining business operations. It also raises critical ethical and privacy concerns that require proper consideration and management. Thus, the purpose of this chapter is to investigate the potential opportunities, challenges, and threats associated with artificial intelligence in retail, highlighting the ethical and privacy concerns and the need for responsible development and application of these technologies. Additionally, it describes the governance mechanism that assists retailers in addressing these issues and ensuring a responsible use of artificial intelligence in business. It also highlights the AI-driven innovations in retail adopted by numerous organizations to enhance their customer experience and operations. Furthermore, by discussing best practices and exploring future trends, the implementation of artificial intelligence in the retail sector will focus on complementing human work rather than replacing employees. Hence, this chapter intends to create a balance between ethical responsibility and technological innovation, offering valuable insights to both policymakers and businesses.

Keywords: Accountability, Algorithm bias, Artificial intelligence, Best practices, Business, Chatbots, ChatGPT, Cybersecurity, Digital, OpenAI.

INTRODUCTION

The recent development and expansion of Artificial Intelligence (AI) have made widespread and drastic shifts in the lives of humans. With technological advancements, the retail sector has undergone significant transformations that enhance the activities and performance of firms in the retail business [1]. In addition to this, it provides smart manufacturing systems and AI models to identi-

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fy purchasing patterns and analyze customer behavior with the employment of big data science [2]. However, with the emergence of Generative AI (GAI) technology, numerous applications, such as increased tracking and visibility, and effective supply chain management, allow retail companies to enhance their organizational capabilities [3]. In a similar vein, adding new learning models, computer programs, and human language to accessible intelligence systems would generate a number of opportunities along with many ethical and reputational risks that threaten human life. Generative Pre-trained Transformers (GPT) and Generative Adversarial Networks (GANs) are two classes of Generative AI (GAI), which include several models, namely, Midjourney and ChatGPT, available at OpenAI, that work at both individual and organizational levels. Moreover, multiple fields and industries have been transformed with the potential of GAI as it becomes crucial for every type of enterprise, be it healthcare, education, entertainment, retail, *etc.* For instance, GAI revolutionizes diagnostics, patient care, and treatment planning through novel, advanced technologies and equipment that significantly benefit the healthcare industry.

In a similar vein, a new era of manufacturing and Industry 4.0 has observed that intelligent automation enables businesses to boost productivity and efficiency by blending both digital and physical systems. Innovations like intelligent chatbots and support systems' enhancements provide personalization and efficiency in customer services [4]. Following this, utilization of GAI-powered tools like Adobe Sensei will automate routine tasks, offer intelligent design recommendations, and generate lifelike images that are already making a difference in the creative industries. Additionally, the ongoing waves of digitalization have marked a major undertaking in the retail sector with an upward trend in the successful application of AI technologies. It has been observed that after adopting generative AI, retail executives' profits surge between an economic value of \$240 billion and \$390 billion, which is equivalent to an increase in 1.2 to 1.9 percentage points across industries [5]. Moreover, the introduction of e-tailing (electronic retailing) and the involvement of ChatGPT in the operations of retail businesses accentuate the success and growth of the economy. Earlier to the development of e-tailing, retail functions and activities were carried out manually and physically, such as sales and inventory management, whereas only some operations were automated with the introduction of barcodes and cash registers. It is only in recent years that every organization, whether local, small, or multinational, has been utilizing e-tailing techniques, transforming digitally through the utilization of the internet. This is particularly adopted due to fewer technological barriers and general awareness about digital technology.

Although it is evident that GAI and ChatGPT have potentially revolutionized data processing and report generation, a host of challenges pose significant risks to

society, including legal, ethical, and security risks [6]. The growing usage of AI has created risks to the lives and livelihoods of individuals. However, these risks, primarily related to ethics and privacy, are a matter of concern. For example, the use of ChatGPT for creating original work will raise complex copyright issues, which is an essential problem because there is no clarity regarding accountability and responsibility for the authenticity and correctness of the generated content. This ultimately results in a legal issue that violates the integrity of creative works and intellectual property rights. Another major concern is the protection of privacy from malicious attacks that have the ability to exploit the personal data or can harm AI models; these security vulnerabilities damage both public trust in AI systems as well as personal information [7].

To overcome the above challenges, collaboration of AI designers with marketing strategists brings a variety of advantages, for instance, optimizing inventory management, boosting customer engagement, forecasting marketing trends, and more. The advancement of digitalization has constantly transformed the retail sector by employing contemporary digital technologies. In addition, the creation and integration of AI in the retail sector have enabled new ways of developing technologies that offer customer retention, increased sales volume, and so on [8, 9]. Approaches such as regulatory measures and policies, Privacy-Preserving Techniques (PPTs), and adversarial defense mechanisms are being employed to address the privacy and security concerns in generative AI. These tools enable the generation of synthetic data and the performance of computations while providing differential policies, privacy during the data generation, secure multiparty computation, and federated learning [10].

Therefore, the main aim of this chapter is to explore the application of artificial intelligence in the retail sector by examining the significant opportunities and barriers of AI and how they affect the innovation and growth of the retail industry, along with society at large. The chapter focuses on the dark side of AI by assessing the underlying ethical and security threats and subsequently providing governance mechanisms that safeguard the data of individuals by working towards harnessing the benefits of AI while mitigating its risks. The chapter tries to bridge the gap between understanding the concept and the usage of AI. It also fulfills the wide gap by encouraging the adoption and incorporation of these advanced technologies into business management by highlighting the AI-driven innovations as well as best practices implemented in the retail sector. Therefore, the objective of the chapter is to explore the potential impact of artificial intelligence to scrutinize both the positive and negative impacts of technology.

CHAPTER 9

Consumer Acceptance of AI-Generated Content in E-Commerce

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Abstract: The integration of artificial intelligence (AI) in e-commerce has revolutionized how products are marketed, personalized, and recommended to consumers. AI-generated content, including automated product descriptions, personalized recommendations, chatbot responses, and visual assets, is increasingly common. This chapter explores consumer acceptance of such content, analyzing key influencing factors, psychological barriers, perceived value, and trust-related issues. It also presents case studies and recent findings from global surveys, offering insights for businesses aiming to improve consumer trust and engagement through AI tools.

Keywords: Artificial intelligence, AI-generated content, Consumer behavior, E-commerce, Personalization, Trust, Technology acceptance.

INTRODUCTION

Motivation

Artificial intelligence (AI) has transformed digital commerce by automating content creation, personalizing consumer experiences, and streamlining business operations [1, 2]. From AI-written product descriptions and chatbots to visual simulations and personalized marketing campaigns, e-commerce platforms increasingly rely on AI to enhance engagement and efficiency [3, 4]. This rapid adoption underscores the importance of understanding how consumers perceive and accept AI-generated content, which directly affects platform success.

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Challenges

Despite these advances, consumer acceptance of AI-generated content remains uneven. Concerns about authenticity, emotional resonance, and privacy significantly influence adoption [5, 6]. Textual outputs, such as product recommendations or descriptions, are generally well-received, whereas immersive media (*e.g.*, AI-generated images, virtual assistants) often face skepticism due to perceived artificiality and limited emotional alignment [7, 8]. Additionally, transparency in data use, cultural norms, and demographic differences in technology adoption pose persistent challenges for global e-commerce platforms [9 - 11].

Understanding consumer acceptance is critical because it shapes purchase decisions, trust in platforms, and long-term consumer–brand relationships [5, 6]. Insights into demographic and cultural variations further allow businesses to design inclusive and trustworthy AI-driven experiences, enhancing both engagement and operational efficiency [9 - 11].

Table 1 provides an overview of the different types of AI-generated content commonly used in e-commerce, including textual, visual, voice-based, and recommendation engine content. The table also outlines the technologies driving these content types, their applications, and the consumer impact they generate.

Table 1. Overview of AI-generated content types in e-commerce.

Content Type	Technology Used	Example Applications	Consumer Impact
Textual	NLP, GPT Models	Product descriptions, chatbots	Improved info delivery, instant support
Visual	GANs, CV Algorithms	Virtual try-ons, AI-generated images	Enhanced product visualization
Voice	Speech Synthesis, NLP	Voice-based shopping assistants	Hands-free, interactive experience
Recommendation Engine	Machine Learning	Personalized product suggestions	Higher satisfaction and engagement

In light of these dynamics, it becomes imperative for e-commerce businesses to not only invest in sophisticated AI tools but also to consider the psychological, social, and ethical dimensions of AI adoption. This includes ensuring transparency in AI operations, maintaining high standards of content quality, and actively engaging consumers in the design and feedback process. Ethical considerations, such as bias mitigation, inclusivity, and accountability, must also be integral to AI development strategies [12, 13].

The introduction of AI-generated content into the e-commerce landscape is not merely a technological innovation; it represents a fundamental shift in how consumers interact with brands, make purchasing decisions, and evaluate digital content. Understanding consumer acceptance in this context requires a multidimensional approach that encompasses technological capabilities, user psychology, cultural context, and ethical governance [14, 15].

This chapter delves deeper into the concept of AI-generated content in e-commerce, explores theoretical frameworks of technology acceptance, identifies key factors influencing consumer perceptions, and provides practical recommendations for businesses seeking to harness AI effectively while maintaining consumer trust and satisfaction. As the lines between human and machine-generated content continue to blur, the challenge lies in navigating this new terrain with sensitivity, responsibility, and foresight [16, 17].

Gaps and Chapter Contribution

Current research emphasizes AI's technical capabilities in content generation but often neglects consumer-centric acceptance frameworks [7 - 9]. Limited work systematically explores how trust, authenticity, transparency, and cultural context interact to influence adoption. This chapter addresses these gaps by examining the psychological, ethical, and cultural determinants of AI content acceptance, highlighting the drivers and barriers to adoption, and providing actionable insights for developing human-aligned AI systems in e-commerce [10, 11].

UNDERSTANDING AI-GENERATED CONTENT IN E-COMMERCE

Artificial Intelligence (AI) is revolutionizing the way businesses interact with consumers in the digital age. Nowhere is this transformation more evident than in the e-commerce sector, where AI-generated content plays a critical role in improving customer experience, increasing operational efficiency, and driving sales. As online shopping continues to grow in popularity, retailers and digital marketers are increasingly leveraging AI to produce engaging, accurate, and personalized content at scale. This section delves into the types, applications, and benefits of AI-generated content in e-commerce [18, 19].

Types of AI-Generated Content

AI-generated content encompasses a wide variety of media formats, each serving distinct roles in enhancing the customer journey. These formats can be broadly categorized into textual, visual, and audio/voice-based content [20, 21].

AI In Retail Traveling: Innovations, Challenges and Governance

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Abstract: The growth of AI has been demonstrating a positive slope in recent years, significantly impacting various sectors of the economy. Hence, this chapter discusses the travel retail sector, which is improving its operations and enhancing customer engagement. Some of its strategies include language processing, machine learning, and predictive analysis that have enabled customised travel itineraries, an efficient booking system, and smarter valuation models. These AI chatbots and virtual assistants have offered services like instant delivery, cost-effective customer support, improved satisfaction, and brand loyalty. The data collected from its customers and stored is analysed, helping businesses offer tailored services like recommendations, enhancing connections with their travellers. This automation of tasks has helped employees focus on complex service needs and strategic decisions. Companies can swiftly respond to market trends and customer behaviour shifts. However, several concerns with this integration still affect everyone involved, including data security risks, ethical considerations, talent gaps, and workflow disruption. To deal with the stated challenges, businesses must work with transparency, reduce bias, ensure privacy protection, and abide by rules and regulations related to ethical concerns. This chapter explores the positive aspects and obstacles of successfully implementing AI in travel brands. To achieve the goal of long-term sustainable growth in this ever-changing global travel landscape, it highlights the need to strike a balance between ethical conduct, adoption of technology, and customer-centric approaches.

Keywords: Algorithm bias, Artificial intelligence, Business, Chatbots, ChatGPT, Cybersecurity, Digital, Ethics, Governance, Personalization.

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INTRODUCTION

Businesses today encounter many critical challenges that include data protection, ethical concerns, and filling the necessary skill gap. Other challenges may include shifting from conventional practices to modern technologies. To sustain, companies should carefully handle these issues by incorporating transparency in their operations, mitigating potential bias, and protecting customer trust. Artificial Intelligence (AI) is rapidly reshaping the travel retail sector by enhancing efficiency and enabling personalized customer experiences [1, 2]. Using tools, such as predictive analytics, natural language processing, and generative AI, firms can better meet demand, deliver personalized recommendations, and manage inventory efficiently [3, 4]. This illustrates why AI integration in the travel retail operating in airport and transit retail has gained significant importance, where success depends on speed, efficiency, and customer engagement [1, 5]. However, the AI integration is still posing some difficulties. Significant implementation expenses, a lack of adequately trained personnel, and dependence on outdated infrastructure often slow its deployment [6, 7]. Concerns regarding data privacy, algorithmic bias, and system transparency further complicate the AI adoption, raising trust and accountability issues [8, 9]. In the absence of careful oversight, these concerns may erode consumer confidence, overshadowing AI's potential to deliver efficient, innovative services.

However, the opportunities are still substantial. Businesses may increase customer satisfaction and achieve sustainability goals at the same time with well-designed systems through AI. AI-powered demand forecasting, for example, may help reduce cost, leading to better efficiency and effectiveness, and personalization tools make travel more relevant by providing individualized suggestions and travel recommendations [1, 2]. At the same time, it is crucial to incorporate the concepts of fairness, explainability, and transparency into governance structures [9] to ensure that AI is used in a responsible manner.

Even though research on AI in retail and tourism is expanding, much of it remains fragmented. Very few studies examine the pragmatic intersections of innovation, governance, and sustainability, while much work focuses on operational performance or customer experiences [4, 10-12]. This chapter aims to bring different viewpoints together by discussing the advantages and disadvantages of artificial intelligence in travel retail through the use of both industry implementations and academic insights. By doing this, it provides a more thorough understanding of how companies might use AI ethically while preserving productivity, ethical principles, and long-term sustainability.

APPLICATIONS OF GENERATIVE AI IN TRAVEL RETAIL

The future of the retail industry has been significantly shaped by generative AI, especially in the airport and transit sectors. By fostering such adoption in the technology, customers' experiences have been elevated and have helped businesses effectively manage and streamline their operations by providing personalized data and related services. Integrating AI into retail strategies, businesses can offer a wide variety of customizations according to the customers' specified requirements. These tailor-made experiences help them connect with today's travelers' expectations [1, 2]. Below are some key applications gaining traction, backed by both academic research and industry insights:

Personalized Product Recommendations in Duty-free Outlets

Generative AI can analyse a rich blend of data, including past purchases, browsing history, upcoming travel itineraries, and demographic information, to suggest products that closely match each traveller's unique tastes. This hyper-personalization makes shopping more engaging and encourages travelers to switch to AI-integrated services [1]. Moreover, AIs can redefine these suggestions in real-time, considering several factors like weather, trending destinations, or local events to optimize selling opportunities [7, 4].

Virtual Try-ons and Smart Interactive Kiosks

Augmented reality, called AR, and computerized vision are making it possible to transform the whole shopping experience by allowing users to actually see how the product would look if tried in reality. The feature is “try on” and is widely helpful for cosmetics and accessories digitally. These smart kiosks provide a fun, hygienic, and contactless way to shop while reducing reliance on physically bought samples, resulting in smoother and more cost-efficient retail operations [2]. As Heins [6] noted, AR-enabled kiosks support mental health and safety standards and offer valuable insights into consumer behaviour by analysing their usage patterns and future interactions.

AI-generated Marketing Content

Retailers actively use tools like ChatGPT and DALL·E to create personalised marketing products and services, including text, images, and videos, that match a traveller's interests, language preferences, and cultural background. This agile and real-time content activation is crucial, especially in international travel settings where people are diverse in many aspects [3, 4]. According to research by Sharma *et al.* [5], AI-generated marketing content is achieving better engagement rates than traditional methods, especially when content is customized, tailored, and

CHAPTER 11

AI and Digital Technologies-Based Techno-Strategic Model for the Mall and Retail Industry

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Abstract: Today's customers are far more discerning and cannot be lured by discounts; they are only influenced by the creation of value. The malls and offline retailers can gather valuable insights from the use cases of malls and retailers that successfully implement AI and digital technologies. The key benefits of using AI-based solutions for retailers include minimised operational costs, enhanced customer engagement, exploration of new revenue avenues, and enabling tenants to boost their productivity. The evolution of customer-driven techno-strategic operating models is necessary for effectively running malls and shopping complexes. At a strategic level, the mall industry needs to rework its current business model, break out of inertia, and embark on a path of change using technological strategy. The strategies should be quickly converted into action, swiftly responding to the market shifts and embracing the uncertainties involved in this digital transformation journey for the end consumer's convenience, and combating e-commerce competitors.

Keywords: Artificial intelligence, Consumer behavior, Digital technologies, E-commerce, Facial recognition, Mall management, Retail industry, Techno-strategic model.

INTRODUCTION

Retail is a growing industry in India, accounting for 30 per cent of India's GDP. It contributes to the subsistence of the 50 million employed population in India (Retailing in India). The Indian retail market encompasses a range of establishments, from small shops to modern Western-style superstores and malls. The industry has made significant progress over the past two decades, with a notable shift toward organised retailing. From a modest growth rate of 2-3% in 2004-2005, organised retail has expanded at a rate of 8-10%, with retail sales reaching one trillion dollars by 2019. The number of malls grew to 725 from just five in 2001 (www.ibef.org).

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Indian consumers prefer clean, vibrant, and technology-oriented malls that promote national and local brands [1]. As consumers become increasingly demanding of products and services, the advent of foreign retail players, and the condensing of product life cycles, the retail business has become increasingly complicated [2]. Uncertainty prevails in the sector as power shifts from producers to consumers. The advent of e-commerce has significantly impacted the mall industry in India, as well as the global economic recession of 2008, demonetisation in 2016, changes in FDI rules, and the introduction of the GST tax system in India. This forced many retailers to close their ailing shops.

Despite these adversities, the investors perceived the Indian market as a gold mine. The mall owners also struggle to survive by offering new brands and experiences in shopping, entertainment, and gaming to lure shoppers to visit the malls. These efforts led to the development of a mall culture among the large middle-class shoppers in India. The rapid urbanisation, the surge of digital technologies, the rising disposable incomes, and the changing lifestyle of a vast middle class are factors driving a revolution in the Indian Mall industry. Brick-and-mortar shops benefit from being physically closer to consumers, allowing them to provide affable services that are not possible online. Hence, investors are willing to invest in retail [3].

A shift in consumer buying patterns, driven by the emergence and expansion of e-commerce, has compelled mall owners and retailers to provide shoppers with seamless, immersive experiences through innovative solutions [4]. The traditional belief of a mall as a shopping destination is changing fast. The surge in online and mobile shopping during the COVID-19 pandemic had a significant impact on mall foot traffic. The technology-led innovations, varying choices of Gen-Z, and online purchasing are diminishing the lifecycle of traditional malls [5]. The mall industry must compete with online platforms like Amazon and Flipkart, which convey personification, convenience, and seamless experiences to buyers. The COVID pandemic and the emergence of E-commerce forced the mall and retail industry to consider investments that support business strategies to survive and accelerate in a new world order of fear of failure and incumbency [6].

Motivation for the Chapter

This chapter is motivated by the urgent need to understand how artificial intelligence (AI) and digital technologies can help reinvent the mall and retail industry in India. With the growing pressure from online commerce and evolving consumer preferences, it is crucial to explore how traditional malls can leverage technology to create sustainable, innovative, and engaging experiences.

Challenges of the Topic

The retail sector, particularly malls, faces multifaceted challenges:

- Declining footfall due to the rise of e-commerce platforms
- Changing consumer behaviours, especially among Gen-Z
- The aftereffects of the COVID-19 pandemic on physical retail spaces
- Shortened lifecycle of traditional mall formats due to rapid digital disruption

These factors demand a strategic response centered on technological innovation and customer-centric solutions.

Significance and Managerial Implications

The implications of this transformation are significant. By adopting AI-driven approaches, mall owners can redefine value creation, from optimising tenant mix and mall layouts to offering hyper-personalised services. Understanding these strategic shifts is crucial for developers, investors, and retailers seeking to remain competitive in an increasingly digital economy.

Research Gaps and Chapter Contribution

While literature discusses the impact of digital transformation and AI across various industries, limited research has focused on the techno-strategic integration of AI in the Indian mall and retail context. Most studies fail to provide practical frameworks or roadmaps that stakeholders can use to implement AI.

This chapter attempts to bridge this gap by:

- Exploring global and Indian developments in AI applications within malls and retail
- Demonstrating strategic use cases where AI has delivered measurable value
- Proposing a techno-strategic model to guide future adoption and innovation in this sector

LITERATURE REVIEW

Shopping Process in the Mall and Retail

Lemon and Verhoef [7] have segmented consumer shopping into three phases: pre-purchase, purchase, and post-purchase. Customers in the pre-purchase phase select the product and pay for it. Customers are directed to products through various channels, the product search process, and attractive pricing. Rhee *et al.* [8]

CHAPTER 12

AI-Generated Visuals for Retail Innovation: Try-Ons, AR, and Dynamic Imagery

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Abstract: Using machine-generated visuals in the purchasing process is now revolutionizing the retail industry by promoting improvements in e-business. Consequently, this critical analysis examines the role of tools based on Artificial Intelligence (AI), including virtual try-ons, augmented reality shopping experiences, and dynamic product image generation. It also allows independent retailers to close the gap between physical and digital shopping, while maintaining immersion and personalization. Through generative AI, the customer can virtually try on any apparel, accessories, or makeup products on images of their own body or face to mitigate the risks associated with high return rates due to uncertain outcomes. Likewise, while using AR applications, consumers can even arrange virtual furniture in their homes or try out various angles of product placement, all of which makes shopping an adventure of its kind. Dynamic product imagery further enhances the online experience by generating images that respond to users' preferences, age, and context. Machine learning algorithms are the ideal tool for creating a large number of visuals at low cost, of equal quality, for different markets. However, the use of these technologies is not without certain impediments. Further details on these issues will be discussed in a later section addressing the limitations of automated systems. Technical issues, such as the precise resolution of renders and their speed, the diversity and bias in AI-generated art, and questions about user data collection to enhance the application's personalized options, are all valid. The following review critically assesses the opportunities that AI-generated visuals offer and hold for retail, as well as their successes and potential shortcomings moving forward. It presents success stories involving leading industries when discussing possible methods for small and medium businesses to implement those breakthroughs. In addition, the management also considers the impact of AI-aided visuals on consumer decisions, purchasing decisions, and brand preferences. Finally, the study presents recommendations for the future, pointing to diversity as the major priority, and minor issues relating to transparency and data protection as important steps towards the progress of AI applications in the retail industry. By fusing consumer insights with its capabilities in the deployment of artificial intelligence in the fashion industry, iKubu is taking its rightful place as a leader in the retail industry's digital transformation.

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Keywords: AI-generated visuals, Augmented Reality (AR) shopping, Computer vision, Customer experience, Dynamic product imagery, Interactive marketing, Personalized shopping, Virtual try-Ons, Virtual fitting rooms, 3D product visualization.

INTRODUCTION

Artificial intelligence (AI) and visual technologies have driven significant change in the retail sector. AI-generated images have enabled business and customer interaction and revenue generation in a different dimension of the business world, thus shifting the industry from the limited physical retail world to the highly immersive world of digital experiences. To enhance customers' shopping experiences, retailers use AI-generated graphics to make them more personalized and engaging. The increasing dependence on e-commerce and digital marketing [1] explains this phenomenon. According to McKinsey and Company [2], integrating AI into retail helps improve consumer satisfaction, optimize operational efficiency, and enhance sales forecasting. AI-generated visuals are essential for bridging the gap between online and in-person retail experiences. Image-based solutions, such as augmented reality (AR) try-ons, AI-based product recommendations, and dynamic, graphically enhanced communication, have enabled consumers to make better choices [3]. Augmented reality applications, such as those offered by companies that sell online, including Sephora and IKEA, enable customers to visualize products in real time, thereby increasing their confidence in online buying decisions [4]. In addition, marketers can use AI-generated imagery and deep learning algorithms to automate content creation, provide a more accurate representation of products, and further improve digital marketing for different consumer segments. Retailers could use Generative Adversarial Networks (GANs) to generate hyper-realistic backgrounds for their product images and tailor them to clients' preferences. They may improve conversion rates [5]. In addition, artificial intelligence-based visual search tools like Google Lens and Pinterest Lens enable users to search for products by image rather than words [6].

Motivation: AI-Driven Personalization in Retail

Artificial intelligence (AI) and visual technologies are completely changing how consumers shop in the retail industry. AI-driven e-commerce applications can be traced back to the early days of machine learning and computer vision, drawing on related platforms. Around the early 2000s, recommendation engines were developed that utilized collaborative filtering algorithms to recommend products to consumers. This was one of the field's first and perhaps most important advances. It was also the final significant strides towards AI-driven

personalization of the retailer using item-to-item collaborative filtering [7]. Visual search tools have transformed the retail industry due to advances in artificial intelligence. Traditional text-based searches have been extended with visual search engines; in some cases, they have been replaced by visual searches alone. Visual search engines let people use photographs instead of keywords to find things. In the middle of the 2010s, platforms, such as Google Lens and Pinterest Lens, changed how people discover products, using deep learning and image recognition to identify and match items from extensive databases. These technologies did a great job of improving user engagement, providing a simpler, faster way to search for products.

However, throughout the mid to late 2010s, augmented reality (AR) made a massive breakthrough in the retail industry. Since then, L'Oréal and Sephora have been the first companies to develop augmented reality virtual try-on solutions, allowing customers to see how makeup and eyewear might suit them in real time before purchasing. It consists of applications that combine digital and physical shopping experiences through artificial intelligence-powered facial recognition and augmented reality overlays, making customers happier and reducing returns. With the use of AI-driven generation models, retail visualization has improved recently. Generative Adversarial Networks (GANs) presented by Goodfellow *et al.* have led to very effective hyper-realistic and dynamic representations of products. These models allow merchants to generate realistic images of their products, enabling consumers to engage with them on a more social and involved level. Fashion retail uses Generative Adversarial Networks (GANs) to generate virtual fashion models and improve design with artificial intelligence. It helps personalize and enhance the shopping experience [8]. Artificial intelligence and visual technologies continue to evolve in retail, resulting in an emerging trend as retailers embrace a more immersive, intuitive, and individualized shopper experience. Given the rapid growth of these technologies, their influence will grow exponentially on consumers, company strategies, and market dynamics.

Significance: Transforming Retail Practices and Consumer Experience

Artificial intelligence has revolutionized many businesses, including the retail sector, which has been most affected. From retail marketing to product visualization and customer engagement strategies, AI-generated images have completely redefined retail marketing in the 21st century. The advanced machine learning algorithms that generate these graphics include generative adversarial networks (GANs) and diffusion models. Such visualizations help companies build hyper-realistic product representations, targeted ads, and virtual shopping. These factors have beneficial effects on the client relationship and also increase sales [9]. The main advantage of using AI-generated photographs in retail is their

CHAPTER 13

Enhancing Customer Retention through AI-Driven Loyalty Programs: A Systematic Literature Review

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Abstract: This chapter examines how artificial intelligence (AI) transforms the design and effectiveness of loyalty programs, with a focus on improving customer retention. A systematic literature review was conducted using Scopus and supplementary scholarly sources to identify how AI tools, such as predictive analytics, recommendation systems, personalization engines, and chatbots, enhance loyalty strategies. The review demonstrated that AI enables more accurate customer segmentation, real-time personalization, and proactive churn prevention, leading to higher engagement and stronger long-term loyalty. Key success factors include data quality, adaptive reward structures, and seamless integration across customer touchpoints. The findings also highlighted persistent challenges, such as privacy concerns, algorithmic transparency, and the need for specialized technical expertise. Overall, the evidence suggests that AI-driven loyalty programs provide measurable improvements in retention, lifetime value, and customer satisfaction, while also reshaping how businesses manage customer relationships. The study identifies gaps in cross-industry applications, ethical frameworks, and SME adoption, offering clear directions for future research.

Keywords: Artificial intelligence, Customer retention, Customer engagement, Loyalty programs, Predictive analytics, Personalization, Systematic literature review.

INTRODUCTION

Loyalty programs have now become a critical course of action to be adopted by firms intending to enhance customer relationships and retention. The effectiveness of such programs is controversial despite the fact that they are widespread. There are positive results documented, including an increase in sales and repeat purchases, whereas others show little result on long-lasting loyalty [1]. This par-

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adox inspires the current chapter that explores how artificial intelligence (AI) can revamp loyalty programs and deal with the long-standing issues.

Conventional loyalty programs are challenged in a number of ways. Most of them are based on fixed program designs and reward systems that cannot keep pace with the different consumer demands [2]. Rewards tend to be perceived as insignificant and are not necessarily the one that leads to long-term involvement. Poorly communicated or those programs that are not part of wider marketing strategies find it hard to keep the customer interested. Besides that, another challenge that businesses might encounter includes the provision of data quality, customer confidence in privacy and security, as well as the expertise to operate AI-driven systems [3, 4].

This chapter is also important as it demonstrates the possibility of increasing the loyalty program performance through AI technologies like predictive analytics, recommendation systems, personalization engines, and chatbots [5]. With these tools, it is possible to understand the customer behavior better, create dynamic segments, and have more relevant and personal interactions. AI can transform loyalty programs into retention strategies that will be sustainable by enhancing customer satisfaction, engagement, and trust [6].

Nevertheless, the current studies on AI-based loyalty programs are still disjointed. Although there is research published regarding AI in marketing and customer engagement, not many of them investigate the topic of AI usage in designing and performance in loyalty programs in a systematic way [7]. This gap is addressed in this chapter, where a systematic literature review (SLR) was carried out. It brings together scholarly and business knowledge in order to define the success factors, challenges, and future trends. By doing so, it also helps in the development of theory and practice with a systematic insight into how AI-driven loyalty programs could be established to create sustainable customer loyalty and competitive advantage.

OBJECTIVES

This study focuses on:

- To understand the factors driving success for AI-powered loyalty programs.
- To explore the impact that AI-powered solutions are having when it comes to customer retention *via* loyalty programs.
- To explore the difficulties and constraints of establishing AI-based loyalty programs.

METHODOLOGY

The synthesised research on the AI-enabled loyalty programmes and their effect on customer retention was conducted through a systematic literature review (SLR) [4, 8, 9]. The keywords included customer loyalty, loyalty programmes, artificial intelligence, predictive analytics, and customer retention, which were used with various combinations in the Scopus database. Though each of the keywords was used individually to retrieve a considerable amount of documents, Customer Loyalty (8591), Loyalty Programmes (9568), and Artificial Intelligence (153), the combined query did not give any integrated results, which indicates a definite gap in research. In line with the past practices of SLR, further resources provided by Google Scholar were searched to include the relevant themes, insights, and best practices that have been discussed in the framework of AI-driven loyalty programmes. The ultimate literature became the foundation of defining trends, challenges, and mechanisms that artificial intelligence helps in terms of customer loyalty and retention in various fields [8].

LITERATURE REVIEW

AI has become a revolutionary tool to optimize loyalty programs to drive customer retention. Traditional loyalty programs, whilst successful in providing POS rewards for transactional behaviour, do not have the agility to develop through multiplying consumer expectations [10]. ASCI monitors and nurtures the relationships between consumers and sellers, and customers and products, and AI-driven solutions fill this gap with relevant hyper-personalization, better and predictive analytics, and most importantly, real-time adaptability, all of which lead to emotional and behavioral privilege [11].

A common thread in the research is AI's ability to analyze large datasets to anticipate customer preferences and churn risks. Predictive modeling and machine learning (ML) also enable firms to segment customers in an order of magnitude more fine-grained than previously possible, allowing marketers to target rewards to individual behavior [12]. For example, dynamic rewards, based on neural networks and reinforcement learning, align the rewards with customer value optimization. Such adaptability improves perceived justice and relevance, which is crucial for maintaining engagement [12].

Moreover, AI-powered loyalty programs go beyond transactions to foster emotional connections. This may inform some of the real-time feedback loops by NLP tools (such as sentiment analysis), allowing companies to mitigate dissatisfaction [13, 14]. Interventions of this nature, involving personalized service provision, serve to enhance trust and address customer churn. It has been established that predictive algorithm-based recommendation systems facilitate

SUBJECT INDEX

A

Advanced algorithms 57, 64, 121, 218, 219
 applying 218
 Advanced tools 17, 127, 249
 implementing 127
 AI-based loyalty programs 241, 243, 244, 246, 247, 248, 250, 251, 252
 AI-based services 61, 71, 90, 208, 218
 AI-generated content 165, 166, 168, 170, 173, 174, 176
 consumer acceptance of 165, 174, 176
 evaluating 173
 AI-generated images 60, 165, 167, 224, 225, 226, 228, 230, 231, 234, 235
 AI-generated retail visuals 234
 inclusive 234
 AI-powered chatbots 15, 68, 167, 193
 AI-powered loyalty programs 68, 241, 242, 244, 245, 249
 AI-powered personalization 9, 13, 26, 80
 AI-powered technologies 98, 152
 designing 152
 AI-powered tools 10, 84, 89, 243
 Algorithmic bias 21, 22, 25, 46, 48, 53, 80, 154, 191, 195, 229
 Artificial intelligence technologies 27, 53, 228, 236, 243
 developing 53
 Augmented reality 113, 114, 115, 116, 122, 124, 127
 Average revenue growth 213, 214, 215, 217

B

Brand commitment 90, 227
 enhanced 90

Nupur Arora, Aanchal Aggarwal, Parul Manchanda, Rohit Bansal & Ramakrishna Yanamandra (Eds.)
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Brand loyalty 41, 43, 44, 64, 74, 85, 98, 118, 122, 133, 190, 233, 246, 252
 enduring 233
 enhanced 64
 long-lasting 43
 enhancing 98, 233
 Browsing history 68, 115, 139, 169, 176, 192, 219
 Business environment 33, 82, 98, 160, 208
 changing 208
 Business growth 67, 119, 246, 251
 sustainable 251
 Business intelligence 34, 50
 traditional 50
 Business knowledge 32, 241
 enhancing 32
 Business models 33, 116, 118, 119, 137, 158, 204, 208, 218
 traditional rent-based 218
 developing innovative 119
 Business operations 23, 58, 110, 118, 138, 157, 180, 208, 228
 agile 45
 Business performance 157
 international 118
 Business processes 32, 49, 95, 135, 251
 Business strategies 33, 132, 141, 154, 158, 194
 contemporary 132
 effective 141
 long-term 194
 Business success 136, 250
 sustained 250

C

CCPA (California Consumer Privacy Act) 16, 22, 25, 46, 48, 155
 Change management 94, 106
 effective 106

Subject Index

- organizational 251
- Checkout processes 106, 109, 124, 211
- Checkout-free stores 13, 15, 16
 - artificial intelligence-powered 13
- Communication channels 59, 245
 - establishing 59
- Competitive edge 31, 68, 74, 83, 108, 113, 114, 137, 160, 184, 193
- Computer vision 6, 7, 13, 30, 155, 159, 201, 211, 213, 224, 243
 - highlighted 7
- Consumer behavior 3, 4, 24, 27, 30, 45, 47, 73, 81, 91, 97, 114, 116, 118, 122, 132, 139, 141, 142, 164, 167, 192, 207, 212, 229
 - human-computer interaction 47
 - changing 3, 45
 - predicting 97
- Consumer confidence 11, 12, 63, 227, 233
- Consumer data 2, 139, 153, 229, 235
 - accessing 235
- Consumer engagement 16, 50, 73, 135, 139, 197, 226
 - enhancing 73
 - increased 226
- Consumer expectations 9, 114, 116, 242
 - multiplying 242
- Consumer experience 5, 122, 141, 208, 225, 229
- Consumer interactions 13, 136, 138, 180, 181
 - automating 13
- Consumer preferences 58, 139, 205, 207, 227, 232
- Consumer trust 2, 8, 11, 12, 46, 116, 125, 166, 173, 175, 177, 178, 180, 182, 197
 - maintaining 166, 178, 197
 - diminished 46
- Content analysis 5
 - qualitative 5
- Content creation 6, 45, 59, 60, 61, 64, 70, 135, 168, 171, 180, 181, 226, 227, 234
 - adaptive 227
 - manual 168
 - simplified visual 234
 - digital advertising's 135
- Content generation 26, 97, 136, 166, 183, 226
 - personalised 136

Generative AI for Retail Innovation 259

- Conversion rates 14, 26, 43, 45, 119, 169, 177, 198, 224, 226, 229, 233
 - boosted 14
 - boosting 198
- Cost savings 13, 16, 31, 53
 - massive 53
- Cultural backgrounds 132, 192, 198, 228
 - varied 132
- Cultural differences 1, 2, 11, 132, 141, 143, 144, 154
- Customer behavior 23, 31, 40, 53, 82, 84, 117, 134, 150, 159, 241, 243
 - forecast 53, 134
 - tools track 82
- Customer emotions 233
 - grasping 80
- Customer engagement 1, 2, 40, 42, 59, 61, 137, 140, 141, 176, 177, 240, 241, 245, 247
 - enhanced 26, 44, 204
 - improving 85, 126
 - increasing 24, 35
 - drive 251
- Customer experience
 - improving 34, 83, 149, 166
 - consistent 171
 - effective 243
 - elevate 123
- Customer journey 82, 126, 166, 183
 - complete 244
- Customer loyalty 68, 69, 79, 80, 81, 82, 83, 84, 85, 86, 88, 89, 90, 91, 242
 - increasing 80, 82, 86, 87, 88
 - improving 81, 91
 - building 82
 - long-term 24
- Customer personalization 24, 25
 - enhancing 1
- Customer profiles 170, 248, 249, 250
- Customer queries 63, 66, 167, 193
 - resolving 68
- Customer retention 151, 240, 241, 242, 243, 244, 245, 246, 247, 249, 250, 251, 252
 - drive 242
 - boosting 90
 - improved 250
- Customer segmentation 21, 209, 219, 240, 246, 248, 250
 - enhancing 252

Customer service 3, 4, 63, 65, 66, 94, 96, 98, 101, 106, 109, 150, 153, 159
 balancing cutting-edge 202
 exceptional 126
 improving 15
 revolutionize 15
Customer trust 143, 196, 231
 protecting 191
 maintaining 170
Customized products 159
 generating 159

D

Data analytics 24, 82, 120, 212, 218
 cutting-edge 52
 real-time 195
Data protection 15, 58, 144, 183, 191, 223, 231, 235
Data protection laws 71, 179, 196, 228, 251
 classical 155
Data security 5, 70, 136, 158, 174, 176, 234
Digital commerce 114, 124, 233
 transformed 164
Digital content 166
 interpreting 174
Digital disruption 29
 rapid 206
Digital environments 174, 236
 immersive 184
 platform-based 114
Digital landscape 70, 181
 ever-changing 122
Digital literacy 12, 174, 182, 184
 lower 174
Digital marketing 50, 113, 114, 118, 132, 136, 138, 142, 143, 224, 229
 channels 216, 217, 219
Digital technologies 28, 150, 152, 204, 205, 207, 208, 209, 210, 213, 214, 215, 216, 217, 218
 advanced 48
 contemporary 151
Dynamic pricing 1, 7, 8, 12, 157, 193, 219
 strategies 21, 39, 53

E

Emerging technologies 10, 152, 171, 178, 228
 complementary 48
Emotion detection 84
 real-time 201
Emotional intelligence 72, 83, 87, 90, 91, 173, 175, 177, 183, 243
Employee training 87, 91, 96, 98, 99, 198, 200
Employee turnover 98
 high 95
Employee workload 195
 reducing 15
Ethical frameworks 143, 160, 240
 developing 98
Ethical standards 5, 143, 182, 196, 231, 233
Experiential marketing 116, 122
 motion 122

F

Facial recognition 26, 28, 142, 193, 194, 201, 204
 artificial intelligence-powered 225
Feedback system 155
 constructive 157
Fitting rooms 126
 virtual 60, 97, 230
Frontline employees 101
 replacing 85

G

GANs (Generative Adversarial Networks) 97, 142, 150, 152, 167, 224, 225, 227
GDPR (General Data Protection Regulation) 10, 11, 16, 22, 25, 46, 48, 155, 179, 182, 196
GenAI (Generative AI) 21, 22, 24, 25, 26, 27, 29, 35, 49, 50, 51, 52, 133, 134
GenAI tools 49, 50, 51, 52
Generative artificial intelligence (GAI) 4, 13, 14, 21, 23, 24, 31, 44, 52, 79, 94, 149, 150
Governance frameworks 53, 196
 robust data 143

Subject Index

Governance mechanisms 47, 149, 151, 152, 154, 196
 clear 232
 corporate 154
 healthy 196
 robust 160
Grocery stores 101, 121
 local 115

H

Historical data 36, 153, 212, 244, 247
Human beings 211
 replacing 207, 208
Human creativity 51, 182
 replacing 175
Human error 98
 reducing 49
Human input 142
 replacing 181
Human interaction 1, 2, 14, 16, 70, 72, 80, 141
Human intervention 75, 152, 154, 159
 reducing 27
Hybrid roles 104, 105, 106, 107

I

Image generation 97
 dynamic product 223
Image recognition 155, 207, 225, 226
In-store engagement 219
 enhancing 10
In-store navigation 14
 aid 125
Informed consent 153, 180, 251
 ensured 5
 obtaining 196
Inventory control 3, 4
 automated 13
Inventory levels 53
 maintaining optimal 45
Inventory management 1, 4, 24, 26, 38, 94, 95, 96, 98, 101, 106, 109, 140, 141
 improving 159
 improved 8, 126
 automating 133

Generative AI for Retail Innovation 261

 changing 199
Inventory systems 98
 innovative 2
Inventory tracking 9, 68, 120
 real-time 6
IoT (Internet of Things) 23, 29, 72, 74, 125, 159, 212, 213, 214, 215, 216, 217

J

Job responsibilities 96
 altered 104

L

Labor costs 44
 lowering 4
 reduced 45
 reducing 85
Language processing 190
 enhanced natural 72
 applying natural 219
Language processing models 159
 natural 152, 155
Large language models (LLMs) 6, 57, 79, 152, 158
Learning algorithms 22, 159, 224, 234
 machine 44, 142, 167, 169, 176, 223, 232, 243, 248, 250
 advanced machine 225
Learning models 139, 150, 226
 machine 80, 84, 90, 94, 149, 252
 advanced machine 40
 multiple machine 159
Legacy systems 143
 fragmented 38
Life cycle 217
 shopping 212
Lifetime value 88, 90, 240, 250
 enhanced 251
 maximize 248
Long-term relationships 65, 66, 73, 75, 85
Loyalty programs 194, 195, 240, 241, 242, 245, 246, 248, 249, 250, 251, 252
 adopted AI-based 245
 efficient 247

- revamp 241
- transform 241
- Loyalty strategies 240, 246
 - redefining customer 80

M

- Machine learning 1, 30, 36, 38, 84, 85, 217, 218, 219, 224, 228, 242, 243
 - general-purpose 23
 - techniques 219, 244, 247
- Mall industry 204, 205, 216, 217
- Mall owners 205, 206, 218
 - compelled 205
- Management practices 29
 - robust data 158
 - sustainable data 158
- Management strategies 199
 - inclusive change 94, 109
- Management systems 16
 - robot-based inventory 217
- Market conditions 40, 197, 244
 - changing 69
- Market dynamics 225
 - changing 219
- Market trends 35, 37, 45, 69, 72, 159, 190, 227
- Marketing campaigns 40, 45, 64, 74, 132, 133, 134, 245, 248
 - digital 133, 135
 - designed 71
 - flexible 57
 - launch 212
- Marketing content 135, 136, 143
 - perceived digital 118
- Marketing efforts 59, 141, 193, 211, 243
 - strengthen relationship 83
 - personalized 40
- Marketing environment 143
 - digital content 118
- Marketing initiatives 234
 - digital 136
- Marketing plans 122, 142, 153
 - inclusive 144
 - tailored 144
- Marketing processes 134
 - repetitive 126

- Marketing strategies 13, 41, 45, 72, 81, 134, 140, 155, 157, 229, 241
 - adaptive 198
 - craft 132
 - digital 135
 - innovative 82
- Marketing tactics 132
 - digital 118
- Massive datasets 142
 - managing 197
- Mobile app 9, 16, 118, 140, 213, 214, 215, 216, 217
- Mobile checkout 213, 214, 215, 216, 217

N

- Natural language processing (NLP) 16, 30, 33, 39, 52, 63, 65, 152, 155, 167, 184, 191, 193, 198
- Neural networks 59, 94, 97, 152, 197, 242
 - artificial 22
 - examined 136

O

- Offline shopping 16, 27, 82, 235
- Online experience 223
 - exceptional 124
- Online shopping 10, 65, 114, 117, 166, 233
- Online stores 63, 66, 114, 226
- Open-ended questions 100, 101, 209, 210
- Operating models 22
 - techno-strategic 204, 219
- Operational costs 153, 157, 199, 208, 210
 - lower 126
 - minimised 204, 219
- Operational efficiency 3, 5, 22, 24, 37, 41, 44, 48, 137, 140, 141, 224, 229
 - enhanced 6, 45
 - improving 32, 228
 - increasing 156, 166
 - enhancing 59, 120
- Organizational structure 95
 - agile 49

P

Perceived ease of use (PEOU) 99, 107, 171, 172
 Personal communication 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
 Personal data 10, 48, 70, 71, 151, 155, 231
 Personal interactions 14, 15, 17, 241
 Personal touch 59, 62, 64, 66, 74
 Personalized content 166, 232
 developing 228
 Personalized recommendations 2, 9, 119, 123, 125, 126, 182, 191, 193, 219, 228
 Personalized shopping experiences 39, 74, 139, 227
 Physical stores 2, 7, 8, 9, 10, 12, 13, 125, 234
 open 216
 Predictive analytics 15, 72, 159, 218, 228, 229, 240, 242, 244, 245, 247, 248, 249, 250, 251
 effective 252
 enhanced 30
 Predictive methods 26
 applying 57
 PRISMA framework 57, 72, 73, 79, 88, 89
 Privacy laws 196
 local 11
 strong 7
 security risks 196
 Privacy rules 11, 12
 strong 11
 Product imagery 35
 high-quality 234
 Product images 167, 224
 dynamic 232
 Product offerings 74
 personalised 60
 Product photography 230
 complete traditional 234
 decent 226
 Product photos 167
 producing high-quality 230
 Product recommendations 7, 15, 25, 41, 44, 81, 126, 141, 165, 167, 169
 AI-based 219, 224, 227
 adaptive 53
 improving 9

skewed 170
 Product visualization 225
 interactive 234
 photorealistic 227
 Promotional videos 59
 short 167
 Purchase history 22, 24, 39, 44, 70, 126, 153, 167, 196, 244

Q
 Qualitative research 5, 100, 138
 high-quality 138

R
 Recommendation engines 25, 39, 47, 198, 224
 Recommendation systems 89, 152, 159, 228, 229, 240, 241
 based 242
 improving 16
 rule-based 39
 Regression analyses 102, 106, 216
 multiple 214, 215
 Reinforcement learning 50, 153, 158, 242
 Repetitive tasks 50, 67, 71, 95, 99, 105, 107, 109
 automating 106, 136
 Research gaps 2, 206, 228
 close 81
 Retail businesses 107, 108, 149, 150, 156, 158, 159, 160, 205, 208, 231, 233
 Retail companies 29, 95, 101, 110, 150
 Retail employees 94, 95, 100, 101, 102
 Retail environments 52, 79, 96, 100, 101, 123, 178, 195, 227
 autonomous 201
 digital 226
 dynamic 123
 fragmented 123
 Retail experience 113, 114, 201, 202
 Retail functions 150
 critical 106

Retail landscape 12, 15, 21, 36, 58, 72, 99, 114, 120

Retail market 193
competitive 229

Retail marketing 23, 132, 144, 225
modern 134
redefined 225

Retail operations 2, 9, 14, 95, 101, 120, 152, 233, 234
cost-efficient 192
improving 3
modern 234
optimizing key 24

Retail organizations 101, 102, 103, 108, 155

Retail players 208
foreign 205

Retail sector 21, 22, 57, 58, 59, 101, 106, 149, 150, 151, 152, 153, 159, 227, 228
in-store 120

Retail spaces 121, 195, 196, 199
digital 201
virtual 227
changing 40

Retail strategies 123, 192, 226
omnichannel 48

Retail value chain 25, 31, 32, 34, 35

Retail workers 95, 98, 99, 101

Retention strategies 241, 243
proactive 90

Revenue growth 208, 210, 215
startup 215, 216

RFID (Radio Frequency Identification) 116, 158, 211, 213, 214, 215, 216

S

Sales data 15, 31
historical 45, 244
archived 33

Sales trends 8, 15, 243, 247

Search engines 119
visual 225

Sentiment analysis 44, 66, 72, 126, 155, 194, 201, 219, 242

Service delivery 81, 85
unequal 195

Service packs 218
operational 218

Service quality 65, 80, 83, 84, 87, 90, 91, 157

Service robots 83, 85, 86, 90
hotel 85

Shopper experience 216
individualized 225

Shopping environments 47
immersive 14
metaverse-based 48

Shopping experience 62, 63, 75, 113, 115, 127, 155, 157, 159, 225, 227, 228, 230
digital 235
enhanced 234
in-store 13
intelligent 43

Social engagement 83
increased 83

Social media 4, 43, 45, 57, 64, 118, 122, 123, 157, 216

Social responsibility 233
corporate 136

Stock levels 8, 39, 69, 98, 140, 159, 194, 219
maintaining optimal 68, 219
adjusting 8
optimizing 8

Supply chains 4, 8, 15, 68, 72, 123, 124, 126, 139, 141, 143
streamline 98
disrupted 217

Sustainable growth 27, 44, 46, 58
long-term 190

T

TAM (Technology Acceptance Model) 90, 99, 107, 137, 171, 172, 173

Technical expertise 107
specialized 240

Technological advancements 59, 61, 72, 75, 90, 113, 120, 149, 226, 233

Technological developments 4, 11, 235
rapid 159

Technology adoption 99, 138, 165, 171

Tenant mix 216
optimising 206

Training datasets 46, 179, 233, 235
 representative 179
Transparency protocols 174, 180, 182, 200
Try-on features 227
 virtual 43, 125

U

User base
 global 184
 large 44
User consent 179, 180, 182
 explicit 196
User engagement 175
 improving 225
User experience 119, 226, 227
 improved 231
UTAUT (Unified Theory of Acceptance and
Use of Technology) 90, 171, 172, 173

V

Value chains 28, 29, 31, 32, 35, 38, 53, 212
 traditional market 28
Virtual assistants 3, 4, 39, 63, 65, 72, 74, 81,
82, 84, 213, 214, 215, 216, 217
Virtual try-ons 14, 48, 159, 167, 192, 193,
200, 223, 230, 232, 234
Visual search tools 225
 artificial intelligence-based 224
VR (Virtual Reality) 115, 118, 122, 127, 226

W

Work environment 95
 positive 87
Workforce dynamics 98, 99, 100, 103, 107,
108
Workforce management 101
 automated 15
 optimizing 15
Workforce planning 109
 influenced 101
Workforce structures 95, 103, 105
 changing 100



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