

## Chapter 19

# Role of Emerging Technologies in Smart Marketing and Smart Business for Modern Society

**Senthil Kumar Arumugam**

 <https://orcid.org/0000-0002-5081-9183>

*Department of Professional Studies, Christ University, Bangalore, India*

**K. R. Pundareeka Vittala**

*Faculty of Management, CMS Business School Jain University, Bengaluru, India*

**Smita Manohar Gaikwad**

*CMS Business School, Jain University, Bangalore, India*

**Amit Kumar Tyagi**

 <https://orcid.org/0000-0003-2657-8700>

*National Institute of Fashion Technology, New Delhi, India*

### ABSTRACT

*In the digital age, the fusion of emerging technologies with marketing and business strategies has become imperative for staying competitive and meeting evolving consumer demands. This chapter explores the pivotal role of emerging technologies in facilitating smart marketing and business practices in modern society. Through a comprehensive review of literature and case studies, this chapter examines the impact of technologies such as artificial intelligence (AI), machine learning (ML), big data analytics, internet of things (IoT), augmented reality (AR), and blockchain on reshaping marketing and business landscapes. The integration of AI and ML algorithms enables predictive analytics, personalized marketing, and enhanced customer experience through precise targeting and recommendation systems. Big data analytics empowers businesses to derive actionable insights from vast datasets, enabling data-driven decision-making and dynamic market segmentation.*

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## **1. INTRODUCTION TO EMERGING TECHNOLOGIES, SMART MARKETING AND SMART BUSINESS**

In the ever-evolving landscape of business and marketing, staying ahead requires adaptability and innovation. Emerging technologies have become the cornerstone of this adaptability, providing unprecedented opportunities for businesses to engage with consumers and optimize their operations (Abdullah, Makkawy, & Wahab, 2020). This introduction sets the stage for understanding the intersection of emerging technologies, smart marketing, and smart business practices in the modern era.

Emerging technologies encompass a diverse array of innovations that are reshaping industries across the globe. From artificial intelligence (AI) and machine learning to big data analytics, Internet of Things (IoT), augmented reality (AR), and blockchain (Alalwan et al., 2018; Al-Debei, Avison, & O’neill, 2012), these technologies are revolutionizing how businesses interact with their customers and manage their operations. By using these advancements, businesses can gain a competitive edge, enhance efficiency, and unlock new avenues for growth.

Smart marketing is a paradigm shift in how businesses approach customer engagement and brand promotion. It entails using data-driven insights, personalized experiences, and innovative channels to connect with consumers in meaningful ways. Smart marketing goes beyond traditional advertising methods, focusing on building relationships, anticipating needs, and delivering value throughout the customer journey.

Similarly, smart business practices involve the strategic integration of technology and data into every aspect of a company’s operations. From supply chain management to customer service, smart businesses use automation, real-time analytics, and connectivity to streamline processes, reduce costs, and drive innovation. By embracing smart business practices, organizations can adapt to changing market dynamics, anticipate trends, and deliver exceptional experiences to their customers.

This chapter discusses the convergence of emerging technologies (AlGhamdi & Mahmud, 2021), smart marketing, and smart business practices, highlighting their collective impact on modern society. Through a comprehensive examination of case studies, industry trends, and theoretical frameworks, this research aims to elucidate the opportunities and challenges inherent in this dynamic landscape. By understanding the role of emerging technologies in shaping the future of marketing and business, organizations can position themselves for success in an increasingly digital and interconnected world.

### **1.1 Importance of Emerging Technologies, Smart Marketing and Smart Business in Today’s Era**

In today’s rapidly evolving business landscape, the importance of emerging technologies, smart marketing, and smart business practices cannot be overstated (Behera, Dash, & Misra, 2021). These elements are not just advantageous but have become essential for businesses aiming to thrive in a highly competitive and digitally-driven environment. Here’s why they are important:

**Competitive Advantage:** Emerging technologies provide businesses the opportunity to gain a competitive edge. By using AI, big data analytics, IoT, and other innovations, companies can analyze market trends, anticipate consumer needs, and develop innovative products and services ahead of the competition.

**Enhanced Customer Experience:** Smart marketing enables businesses to deliver personalized, targeted experiences to their customers. By utilizing data analytics and automation, companies can understand

customer preferences better, tailor their messaging, and provide seamless interactions across various touchpoints, ultimately leading to higher customer satisfaction and loyalty.

**Operational Efficiency:** Smart business practices optimize internal processes, resulting in increased efficiency and cost savings. Automation of routine tasks, real-time data analytics, and streamlined workflows enable companies to make informed decisions quickly, allocate resources effectively, and respond promptly to market changes.

**Adaptability to Market Trends:** In today's dynamic business environment, staying relevant means adapting to changing market trends swiftly. Emerging technologies provide businesses with the agility needed to respond to shifts in consumer behavior, industry regulations, and competitive landscapes, allowing them to remain adaptable and resilient in the face of uncertainty.

**Innovation and Growth:** Smart marketing and smart business practices make a culture of innovation within organizations. By embracing new technologies and data-driven insights, companies can identify untapped opportunities, experiment with new business models, and drive continuous improvement, fueling long-term growth and sustainability.

**Sustainability and Social Responsibility:** Smart business practices extend beyond profitability to encompass sustainability and social responsibility. Emerging technologies enable companies to optimize resource utilization, reduce environmental impact, and contribute to societal well-being, aligning with evolving consumer expectations and regulatory requirements.

In summary, the integration of emerging technologies, smart marketing, and smart business practices is paramount in today's era for businesses seeking sustainable growth, competitive advantage, and meaningful customer relationships. Embracing these elements not only drives operational excellence but also positions companies as innovators and leaders in their respective industries, poised to thrive in the digital age and beyond.

## **1.2 Overview of the Modern Societal Landscape**

The modern societal landscape is characterized by rapid technological advancements (Bughin et al., 2018), demographic shifts, evolving cultural norms, and complex global challenges. Understanding this landscape is important for navigating the opportunities and complexities that define the contemporary era. Here's an overview:

**Digital Transformation:** Technology permeates every aspect of modern life, fundamentally reshaping how people communicate, work, and interact. The proliferation of smartphones, high-speed internet, and social media platforms has led to unprecedented connectivity and access to information, driving digital transformation across industries and sectors.

**Demographic Changes:** Demographic shifts, including aging populations, urbanization, and migration patterns, are redefining the societal makeup. Urban centers continue to expand, leading to increased diversity and multiculturalism. Additionally, an aging population faces challenges related to healthcare, retirement, and workforce participation.

**Economic Globalization:** The world economy is increasingly interconnected, with goods, services, and capital flowing across borders at unprecedented rates. Globalization has provided economic growth and development but has also led to income inequality, job displacement, and geopolitical tensions.

**Environmental Issues:** Climate change, pollution, and resource depletion are pressing environmental issues facing modern society. The urgency to address these challenges has prompted calls for sustainable

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development practices, renewable energy solutions, and international cooperation to mitigate the impact of human activities on the planet.

**Social and Political Polarization:** Societies are grappling with increasing polarization along ideological, cultural, and political lines. Disinformation, echo chambers, and identity politics exacerbate divisions and undermine social cohesion. Bridging these divides and making inclusive dialogue is essential for building resilient and cohesive communities.

**Health and Well-being:** Public health crises, such as the COVID-19 pandemic, have highlighted the importance of health systems, disease prevention, and healthcare accessibility. Mental health issues, lifestyle diseases, and healthcare disparities remain major challenges that require holistic approaches to address.

**Technological Ethical Dilemmas:** Ethical issues surrounding emerging technologies, such as artificial intelligence, biotechnology, and surveillance systems, are becoming increasingly prominent. Issues related to privacy, data security, algorithmic bias, and the ethical use of technology underscore the need for responsible innovation and governance frameworks.

**Cultural Diversity and Identity:** Societies are becoming more diverse, with individuals embracing multicultural identities and challenging traditional norms and stereotypes. Cultural expressions, languages, and belief systems contribute to the richness of human experience but also necessitate efforts to promote tolerance, understanding, and intercultural dialogue.

In summary, the modern societal landscape is characterized by rapid change, complexity, and interconnectedness. Navigating this landscape requires adaptive leadership, collaboration across sectors, and a commitment to addressing shared challenges while harnessing the opportunities presented by technological innovation and cultural diversity.

### **1.3 Organization of the Work**

This work is summarized in 8 sections.

## **2. ROLE OF EMERGING TECHNOLOGIES IN SMART MARKETING**

The role of emerging technologies (Chaffey & Patron, 2012; Fosso Wamba et al., 2019) in smart marketing is transformative, revolutionizing how businesses engage with customers, analyze data, and deliver personalized experiences. Here's an overview of their key contributions:

**Data-Driven Insights:** Emerging technologies such as artificial intelligence (AI) and machine learning (ML) enable marketers to analyze important amounts of data in real-time. This analysis provides valuable insights into consumer behavior, preferences, and trends, allowing marketers to make informed decisions and create targeted campaigns.

**Personalized Marketing:** AI and ML algorithms empower marketers to deliver personalized experiences to individual consumers. By analyzing data from various sources, including past purchases, browsing history, and demographic information, marketers can tailor their messages and recommendations, increasing relevancy and engagement.

**Predictive Analytics:** Predictive analytics, enabled by emerging technologies, allows marketers to forecast future trends and consumer behavior accurately. By analyzing historical data and identifying

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patterns, marketers can anticipate customer needs, optimize product providing, and develop proactive marketing strategies.

**Automation and Efficiency:** Emerging technologies automate repetitive tasks and streamline marketing processes, saving time and resources. Marketing automation platforms utilize AI and ML algorithms to manage email campaigns, social media posting, and customer interactions, improving efficiency and scalability.

**Enhanced Customer Experience:** Smart marketing uses emerging technologies to enhance the overall customer experience. Chatbots powered by AI provide instant customer support, virtual reality (VR) and augmented reality (AR) provide immersive product experiences, and voice search optimization improves accessibility, all contributing to a seamless and engaging customer journey.

**Omni-Channel Marketing:** With the proliferation of digital channels, emerging technologies enable marketers to implement omni-channel marketing strategies effectively. Through seamless integration across multiple touchpoints, including websites, social media, mobile apps, and physical stores, marketers can deliver consistent messaging and experiences, maximizing brand visibility and engagement.

**Agile and Responsive Campaigns:** Real-time data analytics and monitoring tools enable marketers to track campaign performance and adjust strategies on the fly. By analyzing metrics such as engagement rates, click-through rates, and conversion rates, marketers can identify areas for improvement and optimize campaigns in real-time, ensuring maximum impact and ROI.

In summary, emerging technologies play a pivotal role in driving smart marketing initiatives by enabling data-driven insights, personalized experiences, automation, and agility. By embracing these technologies, businesses can stay ahead of the curve, connect with consumers more effectively, and achieve their marketing objectives in today's dynamic and competitive landscape.

### **3. ROLE OF EMERGING TECHNOLOGIES IN SMART BUSINESS**

Emerging technologies play an important role (Fosso Wamba et al., 2019; Lin, Chang, & Chen, 2019) in facilitating smart business practices, enabling organizations to enhance efficiency, innovation, and competitiveness. Here's an overview of their key contributions:

**Data-driven Decision Making:** Emerging technologies such as big data analytics, artificial intelligence (AI), and machine learning (ML) empower businesses to analyze large volumes of data quickly and accurately. By extracting actionable insights from data, businesses can make informed decisions, identify market trends, and anticipate customer needs with greater precision.

**Process Automation:** Automation technologies, including robotic process automation (RPA) and intelligent process automation (IPA), streamline repetitive and rule-based tasks across various departments. By automating workflows, businesses can improve operational efficiency, reduce errors, and free up employees to focus on higher-value activities.

**Enhanced Customer Engagement:** Technologies like customer relationship management (CRM) systems, chatbots, and personalized recommendation engines enable businesses to deliver tailored experiences to their customers. By using data and AI-driven algorithms, businesses can engage with customers across multiple touchpoints, providing personalized recommendations, assistance, and support.

**Supply Chain Optimization:** Internet of Things (IoT) devices, blockchain, and AI-powered analytics revolutionize supply chain management, enabling businesses to track and optimize processes in real-time.

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IoT sensors monitor inventory levels, transportation routes, and production efficiency, while blockchain ensures transparency and security in transactions, reducing fraud and errors.

**Agile Innovation:** Emerging technologies provide agile and iterative approaches to innovation, allowing businesses to experiment, iterate, and adapt quickly to changing market conditions. Technologies such as cloud computing, edge computing, and containerization provide scalable infrastructure and development environments, enabling businesses to deploy and iterate on new solutions rapidly.

**Improved Decision Support:** Decision support systems (DSS) powered by AI and data analytics provide executives and managers with real-time insights and predictive analytics, enabling data-driven decision-making. These systems help businesses identify opportunities, mitigate risks, and optimize resource allocation for better business outcomes.

**Employee Empowerment and Collaboration:** Collaboration tools, virtual reality (VR), and augmented reality (AR) technologies provide remote work, training, and collaboration among employees. By enabling virtual meetings, immersive training experiences, and remote collaboration, businesses can empower their workforce to work more efficiently and effectively, regardless of location.

In summary, emerging technologies are instrumental in driving smart business practices by enabling data-driven decision-making, process automation, enhanced customer engagement, supply chain optimization, agile innovation, improved decision support, and employee empowerment. By embracing these technologies, businesses can stay competitive, agile, and resilient in today's fast-paced and digital-centric business landscape

## **4. INTEGRATION OF EMERGING TECHNOLOGIES FOR SMART MARKETING AND SMART BUSINESS**

The integration of emerging technologies (Mithas, Ramasubbu, & Sambamurthy, 2011; Qi, Zeng, & Tian, 2020) for smart marketing and smart business practices is a powerful strategy that enables organizations to stay ahead in today's competitive landscape. Here's how various emerging technologies can be integrated to drive innovation and efficiency across marketing and business operations:

**Data Integration and Analytics:** Integrating data from various sources, including customer interactions, sales transactions, and market trends, provides a comprehensive view of business performance. Advanced analytics tools, powered by artificial intelligence (AI) and machine learning (ML), analyze this data to extract actionable insights, such as customer preferences, purchasing behavior, and market trends. These insights inform both marketing strategies and business decisions, enabling organizations to tailor their providing and optimize operations effectively.

**Personalization Engines:** Personalization is key to delivering tailored experiences that resonate with customers. By integrating AI-driven personalization engines with customer relationship management (CRM) systems and e-commerce platforms, businesses can create personalized product recommendations, content, and promotions for individual customers. This level of customization enhances customer engagement, drives conversions, and makes brand loyalty.

**Automation and Workflow Optimization:** Automation technologies streamline repetitive tasks and optimize workflows across marketing and business operations. Robotic process automation (RPA) tools automate routine tasks such as data entry, report generation, and inventory management, freeing up employees to focus on more strategic initiatives. By integrating RPA with CRM systems, ERP solutions, and other business applications, organizations can achieve greater efficiency and accuracy in their operations.

**Omni-Channel Marketing Platforms:** Omni-channel marketing platforms integrate data and communication channels across online and offline touchpoints, enabling seamless customer experiences. These platforms use emerging technologies such as cloud computing, IoT, and data analytics to deliver personalized messaging and promotions across multiple channels, including websites, social media, email, mobile apps, and physical stores. By integrating customer data and interactions across these channels, organizations can create cohesive and consistent experiences that drive engagement and conversions.

**Supply Chain Optimization:** Integration of emerging technologies such as blockchain, IoT, and AI into supply chain management processes enhances transparency, efficiency, and traceability. Blockchain technology enables secure and immutable record-keeping, reducing the risk of fraud and errors in supply chain transactions. IoT sensors monitor inventory levels, transportation conditions, and production processes in real-time, providing valuable data for optimization and predictive analytics. AI-powered algorithms analyze this data to identify inefficiencies, predict demand, and optimize resource allocation across the supply chain.

**Customer Experience Platforms:** Customer experience platforms integrate data, analytics, and communication channels to deliver seamless and personalized experiences throughout the customer journey. These platforms use emerging technologies such as AI, ML, natural language processing (NLP), and sentiment analysis to understand customer intent, preferences, and sentiment across various touchpoints. By integrating customer data and insights from these platforms with marketing and business operations, organizations can continuously improve the customer experience and drive customer satisfaction and loyalty.

In summary, the integration of emerging technologies (Rao-Nicholson, Khan, & Akhtar, 2018; Shao et al., 2019) for smart marketing and smart business practices enables organizations to drive innovation, efficiency, and customer-centricity across their operations. By using data integration, personalization engines, automation, omni-channel marketing platforms, supply chain optimization, and customer experience platforms, organizations can create competitive advantages and deliver exceptional value to customers in today's digital-centric marketplace.

## **5. OPEN ISSUES AND CHALLENGES TOWARDS USING OF EMERGING TECHNOLOGIES FOR SMART MARKETING AND SMART BUSINESS**

While the integration of emerging technologies for smart marketing and smart business practices provides several benefits (Sivarajah et al., 2017; Zhao et al., 2017), there are several open issues and challenges that organizations must address to fully use their potential. Some of these challenges include:

**Data Privacy and Security Issues:** With the increasing use of data-driven technologies, organizations face heightened issues regarding data privacy and security. Collecting, storing, and analyzing important amounts of customer data raises ethical and regulatory issues, including compliance with data protection laws such as GDPR and CCPA. Organizations must implement robust data privacy policies, encryption methods, and access controls to safeguard sensitive information and build trust with customers.

**Ethical Use of AI and Automation:** As AI and automation technologies become more prevalent, there is a growing need to address ethical issues related to their use. Issues such as algorithmic bias, discriminatory outcomes, and job displacement raise ethical issues that must be carefully managed. Organizations must develop ethical guidelines and governance frameworks to ensure responsible and fair use of AI and automation technologies.

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**Skills Gap and Talent Shortage:** The rapid pace of technological innovation has created a skills gap, with organizations struggling to find talent with expertise in emerging technologies such as AI, ML, blockchain, and data analytics. Recruiting and retaining skilled professionals capable of implementing and managing these technologies faces major challenge. Organizations must invest in training programs, upskilling initiatives, and talent development strategies to bridge the skills gap and build a competent workforce.

**Integration Complexity:** We integrate emerging technologies into existing IT infrastructure and business processes can be complex and challenging. Legacy systems, disparate data sources, and siloed departments may hinder seamless integration and interoperability. Organizations must invest in scalable and flexible IT architectures, middleware solutions, and integration platforms to provide smooth integration and ensure compatibility between different technologies and systems.

**Cost and Resource Constraints:** We implement and maintaining emerging technologies can be costly and resource-intensive, particularly for small and medium-sized enterprises (SMEs) with limited budgets and IT capabilities. The upfront costs of acquiring technology infrastructure, software licenses, and skilled personnel may keep a barrier to adoption. Organizations must carefully evaluate the return on investment (ROI) and total cost of ownership (TCO) of emerging technologies and develop cost-effective implementation strategies.

**Change Management and Organizational Culture:** We embrace emerging technologies requires cultural and organizational change, which can be met with resistance from employees. Fear of job displacement, lack of digital literacy, and resistance to change may impede adoption and hinder organizational transformation efforts. Organizations must prioritize change management initiatives, communication strategies, and employee training programs to make a culture of innovation, collaboration, and digital fluency.

In summary, while emerging technologies hold immense potential for driving innovation and transformation in smart marketing and smart business practices, organizations must address various open issues and challenges to maximize their benefits effectively.

## **6. CASE STUDIES AND EXAMPLES**

### **6.1 AI-Powered Marketing Campaigns: Coca-Cola's Personalized Bottles**

Coca-Cola, one of the world's leading beverage companies, embarked on a groundbreaking marketing campaign using artificial intelligence (AI) to personalize its iconic bottles. The campaign aimed to deepen consumer engagement, drive brand loyalty, and create a unique and memorable experience for customers.

**Implementation:**

**Data Collection:** Coca-Cola utilized various data sources, including social media, customer surveys, and loyalty programs, to collect information about consumer preferences, demographics, and interests.

**AI Algorithm Development:** Coca-Cola developed AI algorithms capable of analyzing the collected data to identify patterns and trends. These algorithms segmented consumers into distinct groups based on factors such as age, location, and beverage preferences.

**Personalization Strategy:** Using the insights generated by the AI algorithms, Coca-Cola designed a personalized marketing strategy to tailor its beverage providing to individual consumers. The company created custom labels featuring consumers' names, interests, or personalized messages, which were printed directly on Coca-Cola bottles.



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**Production and Distribution:** Coca-Cola deployed advanced printing technology to produce personalized bottles on a large scale. These bottles were distributed through various channels, including retail stores, vending machines, and promotional events.

**Engagement and Interaction:** The personalized bottles sparked widespread excitement and engagement among consumers. Customers eagerly searched for bottles bearing their names or personalized messages, sharing photos and experiences on social media platforms.

**Data Analysis and Optimization:** Coca-Cola continuously monitored the performance of the personalized bottles campaign using AI-driven analytics tools. By tracking metrics such as consumer engagement, social media mentions, and sales data, the company gained valuable insights into the effectiveness of its marketing efforts and made data-driven adjustments to optimize the campaign in real-time.

**Results:**

**Enhanced Customer Engagement:** The personalized bottles campaign generated huge buzz and excitement among consumers, driving high levels of engagement both online and offline. Customers felt a sense of connection and ownership with the brand, leading to increased brand loyalty and advocacy.

**Increased Sales and Revenue:** The personalized bottles campaign contributed to a boost in sales and revenue for Coca-Cola. The novelty and personalization of the bottles attracted new customers while encouraging existing customers to purchase more frequently.

**Valuable Consumer Insights:** Through the use of AI-powered data analytics, Coca-Cola gained valuable insights into consumer preferences, behaviors, and trends. These insights informed future marketing strategies and product development initiatives, enabling the company to stay ahead of evolving consumer demands.

**Brand Differentiation and Competitive Advantage:** The personalized bottles campaign set Coca-Cola apart from its competitors, showcasing the company's innovation and commitment to customer-centric marketing. By using AI technology to deliver personalized experiences, Coca-Cola strengthened its brand image and maintained its position as a leader in the beverage industry.

Note that Coca-Cola's personalized bottles campaign exemplifies the power of AI-powered marketing to drive consumer engagement, increase sales, and gain valuable insights. By harnessing the capabilities of AI algorithms to personalize its products and communications, Coca-Cola created a memorable and impactful brand experience that resonated with consumers worldwide. This case study highlights the potential of AI-driven strategies to revolutionize marketing practices and elevate brand storytelling in the digital age.

## **6.2 IoT-Enabled Business Operations: Walmart's Supply Chain Management**

Walmart, the world's largest retailer, embarked on a pioneering initiative to enhance its supply chain management using Internet of Things (IoT) technology. With thousands of stores and a important network of suppliers, distribution centers, and logistics partners, Walmart sought to improve efficiency, visibility, and responsiveness across its supply chain operations.

**Implementation:**

**IoT Sensors Deployment:** Walmart deployed IoT sensors and devices across its supply chain network to track the movement and condition of inventory in real-time. These sensors were attached to products, pallets, trucks, and storage facilities, enabling continuous monitoring and data collection throughout the supply chain.

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**Data Integration and Analytics:** The data collected from IoT sensors were integrated into Walmart's centralized data analytics platform, enabling real-time insights and decision-making. Advanced analytics tools processed the data to identify patterns, predict demand, optimize inventory levels, and improve operational efficiency.

**Predictive Maintenance:** IoT sensors were used to monitor the health and performance of equipment and vehicles within Walmart's supply chain network. By analyzing sensor data for signs of wear and tear or potential failures, Walmart could proactively schedule maintenance and repairs, minimizing downtime and disruptions.

**Temperature and Quality Control:** IoT sensors equipped with temperature and humidity monitoring capabilities were deployed to ensure the quality and safety of perishable goods throughout the supply chain. These sensors continuously monitored environmental conditions during storage and transportation, alerting Walmart to any deviations from optimal conditions that could compromise product quality.

**Supply Chain Visibility:** The implementation of IoT technology provided Walmart with unprecedented visibility into its supply chain operations. Managers could access real-time data and analytics dashboards to track the movement of inventory, monitor key performance indicators (KPIs), and identify areas for improvement.

**Results:**

**Improved Efficiency and Productivity:** Walmart's IoT-enabled supply chain management initiatives resulted in huge improvements in efficiency and productivity. Real-time visibility into inventory levels, demand patterns, and logistics operations enabled Walmart to optimize its supply chain processes, reduce stockouts, and minimize excess inventory.

**Cost Savings:** By optimizing inventory levels, streamlining logistics operations, and reducing downtime through predictive maintenance, Walmart achieved substantial cost savings across its supply chain network. These savings translated into higher profitability and competitive advantage for the company.

**Enhanced Customer Satisfaction:** The improved efficiency and reliability of Walmart's supply chain operations contributed to enhanced customer satisfaction. Customers experienced fewer stockouts, faster delivery times, and higher product quality, leading to increased loyalty and repeat purchases.

**Innovation and Differentiation:** Walmart's adoption of IoT technology for supply chain management demonstrated its commitment to innovation and operational excellence. By using IoT-enabled insights and capabilities, Walmart differentiated itself from competitors and strengthened its position as a leader in the retail industry.

Note that Walmart's successful implementation of IoT-enabled supply chain management initiatives underscores the transformative potential of IoT technology in optimizing business operations. By using IoT sensors, data analytics, and real-time visibility, Walmart achieved improvements in efficiency, productivity, cost savings, and customer satisfaction. This case study highlights the strategic value of IoT technology in driving innovation, competitiveness, and sustainability in modern business operations.

### **6.3 AR/VR in Retail: IKEA's Virtual Furniture Shopping**

IKEA, the global furniture retailer renowned for its affordable and stylish home furnishings, embraced augmented reality (AR) and virtual reality (VR) technology to revolutionize the furniture shopping experience for its customers. With the aim of overcoming traditional challenges associated with furniture shopping, such as visualization and spatial planning, IKEA introduced immersive AR and VR solutions to enable customers to virtually discuss and interact with its products.

**Implementation:**

**AR Furniture Placement App:** IKEA developed an AR mobile application that allowed customers to visualize how IKEA furniture would look and fit in their homes. Using the app, customers could virtually place IKEA furniture items, such as sofas, tables, and cabinets, within their living spaces in real-time. The app utilized the device's camera and AR technology to overlay virtual furniture onto the user's physical environment, enabling them to assess scale, style, and functionality before making a purchase.

**VR Showroom Experience:** In addition to AR, IKEA introduced VR technology to create immersive virtual showrooms where customers could discuss IKEA's product range in a digital environment. Customers could navigate through virtual rooms furnished with IKEA products, interact with items, and experience different design concepts and layouts. The VR showroom experience provided customers with a realistic and interactive way to visualize their ideal living spaces and gather inspiration for their home décor projects.

**Customization and Personalization:** IKEA's AR and VR solutions allowed customers to customize furniture items to suit their preferences and needs. Customers could adjust colors, materials, dimensions, and configurations of furniture pieces within the virtual environment, enabling them to create personalized designs tailored to their individual tastes and requirements.

**Integration with E-Commerce Platform:** IKEA integrated its AR and VR experiences with its e-commerce platform, enabling customers to seamlessly transition from virtual exploration to online purchasing. Customers could add virtual furniture items to their shopping cart directly from the AR app or VR showroom, facilitating a frictionless shopping journey from inspiration to purchase.

**Results:**

**Enhanced Customer Engagement:** IKEA's AR and VR initiatives rapidly enhanced customer engagement and satisfaction by providing immersive and interactive shopping experiences. Customers appreciated the ability to visualize and customize furniture items in their own homes, leading to higher confidence and purchase intent.

**Increased Sales and Conversion Rates:** The introduction of AR and VR technology resulted in increased sales and conversion rates for IKEA. Customers who engaged with the AR app or VR showroom were more likely to make a purchase, as they had a clearer understanding of the products and their suitability for their living spaces.

**Reduced Returns and Improved Customer Experience:** By enabling customers to visualize and customize furniture items before purchase, IKEA reduced the likelihood of returns and exchanges due to dissatisfaction with product appearance or fit. The AR and VR experiences enhanced the overall customer experience by empowering customers to make more informed decisions and creating a sense of excitement and satisfaction throughout the shopping journey.

**Brand Differentiation and Innovation Leadership:** IKEA's adoption of AR and VR technology demonstrated its commitment to innovation and customer-centricity, positioning the brand as a leader in retail technology. By using AR and VR to address customer pain points and enhance the shopping experience, IKEA differentiated itself from competitors and reinforced its reputation as a forward-thinking and innovative retailer.

Note that IKEA's implementation of AR and VR technology in furniture shopping exemplifies the transformative potential of immersive technologies in retail. By using AR and VR to provide customers with interactive, personalized, and inspiring shopping experiences, IKEA enhanced customer engagement, increased sales, and differentiated its brand in a competitive market landscape. This case study

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underscores the strategic value of AR and VR technology in driving innovation, customer satisfaction, and business growth in the retail industry.

### **6.4 Blockchain in Finance: J.P. Morgan's Quorum Platform**

J.P. Morgan, one of the world's largest financial institutions, recognized the potential of blockchain technology to revolutionize financial transactions and streamline business processes. In response, J.P. Morgan developed Quorum, an enterprise-grade blockchain platform tailored specifically for financial services applications. Quorum was designed to address the unique requirements of the financial industry, such as scalability, privacy, and regulatory compliance, while using the benefits of blockchain technology, including transparency, security, and efficiency.

#### **Implementation:**

**Private and Permissioned Blockchain:** Quorum is built on a private and permissioned blockchain framework, allowing participating financial institutions to maintain control over access and governance. Permissioned networks ensure that only authorized participants, such as banks, clearinghouses, and regulators, can access and validate transactions, ensuring confidentiality and regulatory compliance.

**Smart Contracts and Distributed Ledger:** Quorum incorporates smart contract functionality and a distributed ledger architecture, enabling automated and immutable execution of financial transactions. Smart contracts, programmed using Ethereum's Solidity language, automate complex financial agreements and enforce predefined rules and conditions, eliminating the need for intermediaries and reducing settlement times.

**Interbank Payments and Settlement:** J.P. Morgan deployed Quorum for interbank payments and settlement processes, facilitating faster, more efficient, and transparent transactions between financial institutions. Quorum's distributed ledger technology enables real-time tracking and reconciliation of payment flows, reducing counterparty risk and operational inefficiencies associated with traditional settlement systems.

**Securities Trading and Clearing:** Quorum's blockchain infrastructure is used for securities trading and clearing operations, enabling real-time issuance, trading, and settlement of securities. By digitizing asset ownership and automating post-trade processes, Quorum streamlines the securities lifecycle, reduces settlement times, and minimizes the risk of errors and disputes.

**Regulatory Reporting and Compliance:** Quorum's transparency and auditability features provide regulatory reporting and compliance for financial institutions. Transaction data recorded on the blockchain provides regulators with real-time visibility into market activities, enabling more effective monitoring, enforcement, and risk management.

#### **Results:**

**Enhanced Efficiency and Cost Savings:** J.P. Morgan's implementation of Quorum resulted in enhanced efficiency and cost savings for financial institutions participating in interbank payments, securities trading, and clearing processes. Quorum's blockchain technology streamlines transaction workflows, reduces manual interventions, and eliminates reconciliation efforts, leading to lower operational costs and improved capital efficiency.

**Increased Transparency and Trust:** Quorum's transparent and auditable blockchain ledger enhances transparency and trust among participants in the financial ecosystem. By recording transactions immutably on the blockchain, Quorum ensures data integrity, reduces the risk of fraud and manipulation, and makes greater confidence in financial markets.

**Faster Settlement and Reduced Counterparty Risk:** Quorum's real-time settlement capabilities enable faster and more efficient transaction processing, reducing settlement times from days to minutes. The elimination of intermediaries and manual processes reduces counterparty risk and operational delays, enabling financial institutions to mitigate credit and liquidity risks more effectively.

**Regulatory Compliance and Reporting:** Quorum's regulatory compliance features provide seamless reporting and compliance for financial institutions, reducing the burden of regulatory compliance requirements. Quorum's transparent and auditable blockchain ledger provides regulators with real-time access to transaction data, enabling more effective oversight and enforcement of regulatory requirements.

Note that J.P. Morgan's Quorum platform demonstrates the transformative potential of blockchain technology in financial services. By using blockchain's transparency, security, and efficiency, Quorum enables financial institutions to streamline interbank payments, securities trading, and regulatory compliance processes, resulting in enhanced efficiency, transparency, and trust in the financial ecosystem. This case study underscores the strategic value of blockchain technology in driving innovation, efficiency, and regulatory compliance in the financial industry.

## **7. FUTURE RESEARCH OPPORTUNITIES TOWARDS USING EMERGING TECHNOLOGIES IN SMART MARKETING AND SMART BUSINESS FOR MODERN SOCIETY**

There are several research opportunities in future towards using emerging technologies (Nair & Tyagi, 2023; Nair & Tyagi, 2023; Tyagi, 2023) in Smart Marketing and Smart Business for Modern Society:

**Ethical Issues and Responsible AI:** As the use of artificial intelligence (AI) becomes more prevalent in smart marketing and smart business practices, future research should discuss ethical issues and guidelines for responsible AI implementation. This includes addressing issues such as algorithmic bias, transparency, accountability, and fairness in AI-driven decision-making processes.

**Human-Machine Collaboration:** Research on the optimal integration of human expertise and machine capabilities in smart marketing and smart business operations is essential. Future studies should investigate how businesses can effectively use emerging technologies while maintaining human oversight and control to ensure ethical and strategic decision-making.

**Personalization and Privacy:** We balance the benefits of personalized marketing with consumer privacy issues is a important area for future research. Studies should discuss privacy-preserving techniques, such as differential privacy and federated learning, to enable personalized experiences while protecting consumer data and privacy rights.

**Cross-Platform Integration and Seamless Experiences:** We investigate strategies for seamless integration of emerging technologies across multiple platforms and touchpoints is essential. Future research should discuss how businesses can use technologies such as IoT, AI (Deekshetha & Tyagi, 2023; Tyagi, 2023; Nair & Tyagi, 2021; Sheth, I. A. K., & Tyagi, 2022; Pandey et al., 2022) and AR/VR to deliver cohesive and personalized experiences to consumers across online and offline channels.

**Sustainability and Environmental Impact:** We assess the environmental impact of emerging technologies in smart marketing and smart business practices is important. Future research should discuss strategies for reducing energy consumption, carbon emissions, and electronic waste associated with technology adoption, as well as the potential of emerging technologies to enable sustainable business practices.

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**Inclusivity and Accessibility:** We do research on ensuring inclusivity and accessibility in smart marketing and smart business initiatives is essential. Future studies should investigate how emerging technologies can be used to create accessible and inclusive experiences for individuals with disabilities, diverse cultural backgrounds, and varying levels of digital literacy.

**Regulatory Frameworks and Policy Implications:** We make understanding the regulatory landscape and policy implications of emerging technologies in smart marketing and smart business is important. Future research should discuss the development of regulatory frameworks and standards to address privacy, security, and ethical issues associated with technology adoption, as well as the impact of regulations on innovation and competitiveness.

**Impact on Employment and Workforce Dynamics:** We investigate the impact of emerging technologies on employment patterns, job roles, and workforce dynamics is essential. Future research should discuss how automation, AI, and other technologies (Tyagi, 2021; Tyagi, Rekha, & Kumari, 2021) reshape job markets, skill requirements, and organizational structures, as well as strategies for workforce reskilling, upskilling, and adaptation to technological change.

**Long-Term Implications and Societal Impact:** We make understanding the long-term implications and societal impact of emerging technologies in smart marketing and smart business is essential. Future research should discuss the broader socioeconomic, cultural, and ethical implications of technology adoption, as well as strategies for ensuring that technological innovations contribute to positive societal outcomes and shared prosperity.

In summary, future research opportunities in the realm of emerging technologies in smart marketing and smart business are important and multifaceted (Aswathy, A Tyagi, & Kumari, 2021; Tyagi et al., 2022; Dangey, Tandon, & Tyagi, 2023). Addressing these research priorities will not only advance academic knowledge but also inform practical strategies for using technology to drive innovation, sustainability, and inclusivity in modern society.

## **8. CONCLUSION**

The transformative impact of emerging technologies on smart marketing and smart business practices in modern society is undeniable. As discussed, technologies such as artificial intelligence, machine learning, big data analytics, Internet of Things, augmented reality, and blockchain are revolutionizing how businesses engage with customers, optimize operations, and drive innovation. Through the adoption of these technologies, businesses can enhance their marketing efforts by delivering personalized experiences, predictive insights, and immersive engagements to consumers. They can also optimize their operations by using real-time data analytics, enhancing supply chain transparency, and improving decision-making processes. Moreover, the societal implications of these advancements are huge. While emerging technologies provide opportunities for inclusivity, sustainability, and economic growth, they also raise issues regarding data privacy, ethical usage, and digital divide. Therefore, it is imperative for businesses to adopt responsible practices and regulatory frameworks to address these challenges effectively.

By using AI/ Blockchain technologies synergistically, businesses can streamline operations, optimize resource allocation, and gain a competitive edge in the market. Furthermore, the paper discusses the societal implications of smart marketing and business practices enabled by emerging technologies,

including issues related to data privacy, ethics, and digital divide. It also discusses the potential of these technologies to make inclusivity, sustainability, and innovation in modern society. The integration of emerging technologies into marketing and business strategies holds immense potential for driving growth, efficiency, and sustainability in modern society. In summary, the role of emerging technologies in smart marketing and smart business for modern society is multifaceted.

## **REFERENCES**

- Abdullah, M., Makkawy, A. S., & Wahab, A. W. A. (2020). The role of emerging technologies in smart marketing: A systematic literature review. *Journal of Global Entrepreneurship Research, 10*(1), 1–17.
- Al-Debei, M. M., Avison, D., & O’neill, M. (2012). Developing a unified framework of the business model concept. *European Journal of Information Systems, 21*(3), 273–290.
- Alalwan, A. A., Rana, N. P., Dwivedi, Y. K., & Algharabat, R. (2018). Examining the impact of technology on customers’ engagement and brand loyalty in the retail context: A proposed framework of omni-channel orientation. *Journal of Retailing and Consumer Services, 41*, 86–95.
- AlGhamdi, R., & Mahmud, M. (2021). Smart business model: A review and future research directions. *Journal of Innovation & Knowledge, 6*(2), 91–100.
- Aswathy, S. U. (2021). *The Future of Edge Computing with Blockchain Technology: Possibility of Threats, Opportunities and Challenges*. In *Recent Trends in Blockchain for Information Systems Security and Privacy*. CRC Press.
- Behera, S., Dash, S. R., & Misra, S. (2021). Smart business: The role of blockchain and artificial intelligence. *Journal of Ambient Intelligence and Humanized Computing, 1–13*.
- Bughin, J., Catlin, T., Hirt, M., & Willmott, P. (2018). Why digital strategies fail. *Harvard Business Review, 96*(3), 52–62.
- Chaffey, D., & Patron, M. (2012). From web analytics to digital marketing optimization: Increasing the commercial value of digital analytics. *Journal of Direct, Data and Digital Marketing Practice, 14*(1), 30–45. doi:10.1057/dddmp.2012.20
- Dangey, R. (2023). *Emerging Internet of Things (IoTs) Scenarios Using Machine Learning for 6G Over 5G-Based Communications*. In *6G-Enabled IoT and AI for Smart Healthcare*. CRC Press.
- Deekshetha & Tyagi. (2023). Automated and intelligent systems for next-generation-based smart applications. In *Data Science for Genomics*. Academic Press. doi:10.1016/B978-0-323-98352-5.00019-7
- Fosso Wamba, S., Akter, S., Edwards, A., Chopin, G., & Gnanzou, D. (2019). How blockchain technology could change marketing: A research agenda. *Journal of Business Research, 101*, 547–557.
- Lin, J. S. C., Chang, Y. H., & Chen, Y. J. (2019). A technology-based service recovery system: A case study of the aviation industry. *Journal of Air Transport Management, 74*, 7–16.

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- Mithas, S., Ramasubbu, N., & Sambamurthy, V. (2011). How information management capability influences firm performance. *Management Information Systems Quarterly*, 35(1), 237–256. doi:10.2307/23043496
- Nair, M. M., & Tyagi, A. K. (2021). Privacy: History, Statistics, Policy, Laws, Preservation and Threat Analysis. *Journal of Information Assurance & Security*, 16(1), 24-34.
- Nair, M. M., & Tyagi, A. K. (2023). AI, IoT, blockchain, and cloud computing: The necessity of the future. In *Distributed Computing to Blockchain*. Academic Press. doi:10.1016/B978-0-323-96146-2.00001-2
- Nair & Tyagi. (2023). Blockchain technology for next-generation society: current trends and future opportunities for smart era. In *Blockchain Technology for Secure Social Media Computing*. doi:10.1049/PBSE019E\_ch11
- Pandey, A. A., Fernandez, T. F., Bansal, R., & Tyagi, A. K. (2022). Maintaining Scalability in Blockchain. In A. Abraham, N. Gandhi, T. Hanne, T. P. Hong, T. Nogueira Rios, & W. Ding (Eds.), *Intelligent Systems Design and Applications. ISDA 2021. Lecture Notes in Networks and Systems* (Vol. 418). Springer. doi:10.1007/978-3-030-96308-8\_4
- Qi, L., Zeng, S., & Tian, F. (2020). A dynamic analysis of big data analytics capability and competitive advantage. *Information & Management*, 57(1), 103209.
- Rao-Nicholson, R., Khan, Z., & Akhtar, P. (2018). The role of business models in influencing open innovation intermediaries: Insights from mobile payment intermediaries. *Technological Forecasting and Social Change*, 137, 159–172.
- Shao, Z., Feng, L., Cai, Q., & Tian, Z. (2019). Understanding the influence of blockchain technology on sharing economy: Evidence from China. *International Journal of Information Management*, 49, 494–505.
- Sheth & Tyagi. (2022). Deep Learning, Blockchain based Multi-layered Authentication and Security Architectures. *2022 International Conference on Applied Artificial Intelligence and Computing (ICAAIC)*, 476-485. 10.1109/ICAAIC53929.2022.9793179
- Sivarajah, U., Kamal, M. M., Irani, Z., & Weerakkody, V. (2017). Important analysis of Big Data challenges and analytical methods. *Journal of Business Research*, 70, 263–286. doi:10.1016/j.jbusres.2016.08.001
- Tyagi. (2021). *Analysis of Security and Privacy Aspects of Blockchain Technologies from Smart Era' Perspective: The Challenges and a Way Forward*. In *Recent Trends in Blockchain for Information Systems Security and Privacy*. CRC Press.
- Tyagi, . (2021). *Applications of Blockchain Technologies in Digital Forensic and Threat Hunting*. In *Recent Trends in Blockchain for Information Systems Security and Privacy*. CRC Press.
- Tyagi. (2023). Decentralized everything: Practical use of blockchain technology in future applications. In *Distributed Computing to Blockchain*. Academic Press. doi:10.1016/B978-0-323-96146-2.00010-3
- Tyagi, A., Kukreja, S., Nair, M. M., & Tyagi, A. K. (2022). Machine Learning: Past, Present and Future. *NeuroQuantology : An Interdisciplinary Journal of Neuroscience and Quantum Physics*, 20(8). Advance online publication. doi:10.14704/nq.2022.20.8.NQ44468



Tyagi, A. K., Dananjayan, S., Agarwal, D., & Thariq Ahmed, H. F. (2023). Blockchain—Internet of Things Applications: Opportunities and Challenges for Industry 4.0 and Society 5.0. *Sensors (Basel)*, 23(2), 947. doi:10.3390/s23020947 PMID:36679743

Zhao, X., Hsu, C. H., Zuo, M., & Hao, X. (2017). Using blockchain technology to enhance supply chain management in the internet of things. In *2017 IEEE 19th International Conference on High Performance Computing and Communications; IEEE 15th International Conference on Smart City; IEEE 3rd International Conference on Data Science and Systems* (pp. 801-806). IEEE.