MARKETING 5.0

THE ROLE OF HUMAN-MIMICKING TECHNOLOGY

EDITED BY

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INVESTOR IN PEOPLE

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Preface

The advent of Marketing 5.0 heralds a new era where artificial intelligence (AI) and human-mimicking technology revolutionise the marketing landscape. The edited book 'Marketing 5.0 The Role of Human-Mimicking Technology' delves into this transformative journey, exploring how these technologies enhance consumer engagement, drive personalised experiences and redefine organisational strategies.

The opening chapter sets the stage by introducing the core concepts of Marketing 5.0, emphasising the integration of AI and human-mimicking approaches. It lays a foundational understanding of how these technologies create more personalised and efficient marketing strategies, enhancing consumer satisfaction and loyalty.

Following this introduction, the book explores various facets of consumer-centric technology. *Chapter 2* examines the synergy between customer-centric technology, consumer accountability and organisational culture. This chapter highlights the critical role of technology in aligning organisational values with consumer expectations, ultimately driving retail success.

In *Chapter 3*, the focus shifts to product customisation powered by technology. This chapter illustrates how AI-driven customisation meets individual consumer needs, offering unique and personalised products that enhance the consumer experience and foster brand loyalty.

Chapter 4 delves into the future of marketing through influencers and algorithms. It decodes the impact of digital influencers and the algorithms that drive consumer behaviour, offering insights into the evolving dynamics of consumer mimicry in the digital age.

The potential of AI in human-mimicking technology is further explored in *Chapter 5*. This chapter discusses how leveraging AI for human mimicry in marketing can create more authentic and engaging consumer interactions, bridging the gap between technology and human touch.

Retail transformation through mimicking technologies is the focus of *Chapter 6*. It examines how these technologies facilitate and transform customer retail experiences, enhancing convenience, personalisation and overall satisfaction.

Chapter 7 addresses the significant shift from business-centric to consumer-centric models in AI-driven social media. This chapter underscores the power dynamics in social media marketing, where consumers hold more influence and control over brand interactions.

The book also offers qualitative insights into specific applications of mimicking technology. *Chapter 8* presents a case study on the role of such technologies in electronic customer relationship management within the service sector, highlighting practical implementations and outcomes.

Sustainable and susceptible use of AI in corporate marketing is discussed in *Chapter 9*. This chapter provides a balanced view of the benefits and challenges of integrating AI into corporate strategies, ensuring ethical and sustainable practices.

Chapter 10 explores the role of consumer-centric technology in enhancing customer engagement. It offers strategies for leveraging mimicking technologies to create meaningful and lasting consumer connections.

The intriguing debate on servitisation's potential is tackled in *Chapter 11*, questioning whether technology or service leads the transformation in modern business models.

The consumer decision-making journey is analysed in *Chapter 12*, focusing on how mimic technology influences every stage of the journey, from awareness to purchase.

Ethical and legal implications of human-mimicking technology in customer engagement are critically examined in *Chapter 13*. This chapter provides a comprehensive overview of the potential risks and regulatory challenges associated with these technologies.

Chapter 14 investigates how mimicking technology helps understand consumer behaviour and its impact on engagement. It explores the psychological and behavioural aspects influenced by technology.

In *Chapter 15*, the book discusses creating and optimising marketing value through customer experience, retention and loyalty using mimicking technology. This chapter emphasises the long-term benefits of integrating these technologies into marketing strategies.

The concluding chapter examines the role of AI-enabled mimic technology and social robots in the consumer decision-making journey, offering a futuristic perspective on technology-driven consumer interactions.

Overall, this book provides a thorough and insightful exploration of how human-mimicking technology aligns with Marketing 5.0, offering valuable knowledge for academics, practitioners and anyone interested in the future of marketing and consumer engagement.

Introduction

Welcome to the dawn of Marketing 5.0, a paradigm shift in the ever-evolving landscape of consumer engagement. In this era, traditional marketing tactics no longer suffice in capturing the hearts and minds of modern consumers who are more discerning, interconnected and empowered than ever before. As markets evolve, so must the marketing strategies, tools and philosophies that guide us. As technology continues to reshape our world at an unprecedented pace, marketers are compelled to adapt, innovate and redefine their strategies to stay relevant amidst the tumultuous currents of change.

In a world of plentiful data and few meaningful connections, Marketing 5.0 is not merely a carryover of its forebears. Rather, it is a revolution. Through an exploration of the concepts, tactics and revolutionary possibilities, we set out on a journey through this book. We explore the intersection of human-centred values, cutting-edge technologies and cross-disciplinary insights.

This book aims to offer you with the mindset required to flourish at a time of profound upheaval, where the AI-enabled marketing solutions are offering values to not only customers but the marketers too. Human mimicking is one of the creative functions of AI which enhance customer experience to the next level. Therefore, implying solutions based on the amalgamation of big data, machine learning and artificial intelligence offering the most accurate marketing solutions to the marketers.

This book aims to guide you in the uncharted territory of Marketing 5.0., where technology led solutions unprecedented customer experience. No matter, whether you are a marketer, customer, an aspiring entrepreneur or just a keen observer of the changing tides of marketing practices. Join us as we set out on a mission to solve the puzzles, grab the chance and steer clear of obstacles in the era of empowered customers and endless chances.

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Chapter 1

Marketing 5.0: Artificial Intelligence and Human Mimicking Approach

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Abstract

The rise of Artificial Intelligence (AI) signals a new chapter in the realm of digital transformation, presenting significant implications for businesses globally. With rapid advancements in technology and the widespread impact of AI, maintaining competitiveness in various industries is met with growing challenges. This piece explores the concept of Industry 5.0, where robots work in harmony with human intelligence, ushering in a new era of collaborative manufacturing.

It investigates the integration of AI into Marketing 5.0 strategies, highlighting its crucial role in helping companies transition towards AI as a Service. The article also outlines the benefits and considerations of Industry 5.0, offering insights into the potential implications for manufacturers. Additionally, recent advancements tailored for Industry 5.0 applications and environments are elucidated.

The conversation also touches on how Industry 5.0 will affect manufacturing industries and the economy as a whole. It highlights the opportunities it could bring for businesses, rather than focusing on the potential job displacement. Industry 5.0 is seen as a powerful force that will drive economic growth and increase productivity in manufacturing. It emphasises the important relationship between human creativity, technological advancement and industrial advancement.

Keywords: Industry 5.0; Artificial Intelligence; advanced manufacturing; human mimicking; digital transformation

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Introduction

The development of modern transformations has moulded the course of mankind's set of experiences, significantly influencing economies, social orders and societies around the world. Following back to the 1780s, the Primary Modern Insurgency denoted the start of another time with the bridling of mechanical power from water, steam and petroleum products. This change prepared for huge headways in assembling processes, prompting exceptional monetary development and urbanisation.

The Second Modern Unrest, which arose in the late 1900 years, saw the broad reception of electrical energy by makers. This period saw the presentation of sequential construction systems and large-scale manufacturing methods, changing enterprises, for example, cars, steel and materials. These advancements' expanded effectiveness and efficiency further sped up the monetary turn of events and globalisation.

During the 1970s, the world entered the Third Modern Upset, described by the joining of hardware and data advances into assembling processes. Robotisation turned out to be progressively common, considering more prominent accuracy, speed and customisation underway. This period laid the foundation for the computerised age and changed businesses going from media communications to funding.

The Fourth Modern Unrest, frequently alluded to as Industry 4.0, addresses the combination of advanced, physical and natural innovations. When it comes to making informed decisions, understanding the logic and processes behind the models is essential to trust them and make responsible choices (Ahmed et al., 2022). This stage is set apart by the far and wide reception of the Web of Things (IoT), man-made consciousness and distributed computing, empowering the formation of digital actual frameworks. These frameworks influence information and networks to upgrade creation processes, improve navigation and make new plans of action.

Regardless of being in its outset, Industry 4.0 holds tremendous potential to change different areas, including fabricating, medical care, transportation and agribusiness. The consistent incorporation of innovation into each part of our lives guarantees expanded proficiency, efficiency and maintainability. Nonetheless, it likewise presents new difficulties, like network safety dangers, work dislodging and moral worries encompassing information security and computer-based intelligence.

Looking forward, there is a developing hypothesis about the rise of a Fifth Modern Unrest. This speculative stage imagines independent assembling frameworks engaged by human knowledge, obscuring the lines between man and machine. As innovation keeps on developing at a phenomenal speed, industry trailblazers and innovation pioneers should expect future patterns and adjust appropriately (Bishop, 2006).

One of the main thrusts behind the fast progression of innovation is the expansion of the Web. With an expected extra 3 billion individuals expected to get close enough to the Web by 2025, the potential for development and network is unfathomable. Nonetheless, with an incredible open door comes extraordinary obligation. We should move towards this computerised change with wariness and prescience, aware of its effect on society and the climate.

As historian Carr and Zafer Sayar, 1980 famously remarked, 'Change is certain, success is not.' In an era defined by constant disruption and innovation, it is essential to embrace change while also striving for success. By staying informed, adaptable and collaborative, we can navigate the complexities of the digital age and harness the full potential of the Fifth Industrial Revolution.

The transition from the traditional manufacturing landscape to the era of Industry 4.0 has brought forth a paradigm shift in industrial processes and strategies (Nahavandi et al., 2015). This revolution, originating from a German government initiative, emphasises the transformation of manufacturing from fully physical systems to cyber-physical systems (CPS), facilitated by the integration of the Internet of Things (IoT). The foundation of Industry 4.0 lies in the real-time communication between CPS, generating vast amounts of data necessitating efficient and secure storage solutions, often met through cloud storage. The ensuing investigation of this information joined with IoT, brought about the idea of the Modern Web, overcoming any barrier between the computerised and actual domains.

The drivers of Industry 4.0 incorporate the omnipresent accessibility of the Web and IoT, the reconciliation of business and assembling processes, the execution of computerised twins and the enhancement of creation lines and items. This upset has presented different new ideas like CPS, IoT, savvy plants, large information, distributed storage and online protection, bringing about massive expense decreases underway, coordinated operations and quality administration.

Notwithstanding, despite the headways achieved by Industry 4.0, there are critical difficulties and impediments. One of the essential worries is the likely effect on work because of expanded computerisation and interaction advancement. While Industry 4.0 intends to upgrade processing? productivity, it might accidentally ignore the human expense related to these advancements, prompting opposition from worker guilds and policymakers. This features the requirement for a more adjusted approach that considers both innovative progressions and human government assistance.

In addition, Industry 4.0 misses the mark in tending to natural supportability worries, regardless of the developing spotlight on ecological security in the assembling business (Kagermann et al., 2011). While man-made reasoning (simulated intelligence) calculations have been used to investigate maintainability issues, solid concentration and activity are absent in Industry 4.0 towards ecological security. This hole highlights the requirement for a more exhaustive mechanical answer to address ecological difficulties and increment supportability.

In light of these restrictions, the idea of Industry 5.0 arises as an answer that joins the qualities of human knowledge with independent machines. Not at all like Industry 4.0, which centres fundamentally around robotisation, Industry 5.0 imagines cooperative energy among people and robots, where robots act as cooperative accomplices as opposed to substitutions for human labourers (Yang et al., 2019). These cooperative robots, or cobots, can comprehend human aims and work close by people to upgrade process effectiveness and efficiency.

Xu et al. (2020) explore different viewpoints on edge intelligence, centring on data, models and computation. Similarly, Yang et al. (2019) delves into federated learning methods, such as horizontal and vertical approaches, as well as federated transfer learning and the corresponding structures. In contrast, Wan et al. (2020) present a framework that combines cloud computing, edge computing and local computing models, with a focus on smart devices, smart interactions, an Artificial Intelligence (AI) layer and smart services (Xu et al., 2020).

The execution of Industry 5.0 is exemplified through a creation line situation, where human specialists team up with robots outfitted with cutting-edge detecting and learning capacities (Thurman, 2017). These cobots help human specialists as well as gain from their activities to perform undertakings effectively and securely. This cooperative methodology further develops process productivity as well as upgrades the general work insight for human administrators.

The evolution towards Industry 5.0 is expected to introduce a new manufacturing role: the Chief Robotics Officer (CRO). This individual will possess expertise in understanding robots and their interactions with humans, thereby enabling informed decisions regarding the integration or removal of machines from the factory floor to optimise performance and efficiency (Wan et al., 2021). CROs will have diverse backgrounds in robotics, AI, human factors modelling and human–machine interaction (Nayak et al., 2015). Leveraging collaborative robotic technologies and advancements in computation, CROs will play a crucial role in environment management, contributing to the sustainability of human civilization by reducing pollution, minimising waste generation and preserving the Earth's resources.

Methodology for the Solution: What Is Required for Industry 5.0?

In the preceding section, we explored how Industry 5.0 aims to address the challenges stemming from the displacement of human workers in various processes. However, achieving this goal requires the adoption of even more advanced technologies, which we will discuss in detail below.

- *Networked Sensor Data Interoperability*: From smart homes to autonomous manufacturing systems like cobots, the ubiquitous sensing and collection of big data are essential components of the next industrial revolution. Achieving this level of data collection and analysis is made possible through networked sensors (Chen et al., 2008). These sensors not only facilitate faster analyses but also enable customisation processes to a degree previously unattainable. By incorporating low-level intelligence and processing power, these sensors minimise the need for high-bandwidth data transfer mechanisms and allow for local preprocessing of data. This distributed intelligence enhances network efficiency while creating opportunities for unprecedented customisation in manufacturing processes. However, a common framework for information transfer is crucial to fully leverage the potential of sensor networks.

- *Multiscale Dynamic Modelling and Simulation*: Digital Twins: With the advent of autonomous systems, manufacturing setups have become increasingly complex, necessitating advanced evaluation and monitoring techniques. Digital twins, virtual models of processes, products or services bridge the gap between the virtual and physical worlds, enabling comprehensive analysis and optimization of manufacturing operations (Yetilmezsoy et al., 2011). By leveraging big data processing and AI, modern digital twins can simulate various operating scenarios with remarkable accuracy. Additionally, these digital twins account for process uncertainties, thereby minimising wastage and enhancing system design. Coupled with state-of-the-art visualisation and modelling techniques, technologies like digital twins promise to revolutionise productivity across all sectors (Nahavandi & Preece, 1994).
- *Shopfloor Trackers*: Shopfloor trackers play a crucial role in real-time production tracking and resource management. By associating sales orders with production orders and materials, these trackers optimise resource allocation and enhance operational efficiency. Real-time tracking of assets and process flow enables online process optimization, leading to reductions in material wastage, theft prevention and improved asset management (Papadimitriou, 2012). Whether implemented as networked sensors or integrated with IoT and machine learning technologies, shopfloor trackers offer tangible benefits for manufacturers striving for operational excellence.
- *Virtual Training*: Virtual training, which originated in 1997, involves learning specific tasks or skills in a simulated environment. This approach offers various benefits, including cost and time reserve funds for the two mentors and students. Also, virtual preparation is exceptionally adaptable and can be effortlessly refreshed and reconfigured for new courses. For example, the General Movement Test system (UMS) gives haptically empowered preparation conditions to different callings, like drivers, pilots, firemen and clinical experts (Alzoubi et al., 2019).

  By recreating genuine situations without presenting students with actual dangers, virtual preparation guarantees successful expertise improvement while focusing on security and cost viability. Virtual preparation assumes an essential part in developing a gifted labour force while relieving gambles related to live cycles and defending human specialists from expected risks. This approach is especially important for occupations including dull activities or stances that present intrinsic dangers (Nahavandi, 2019). By incorporating virtual preparation with human stance examination, a great many labourers can get far-reaching and practical preparation without openness to unsafe circumstances (Saeid Nahavandi, 2016).

  The viability of virtual preparation is altogether upgraded through the mixture of virtual and increased reality strategies. Utilising ongoing headways in graphical handling units (GPUs), huge information and man-made brainpower (artificial intelligence), virtual preparation rises above past restrictions to offer uplifted authenticity and viability. Additionally, haptic innovations, which repeat material sensations, advance virtual preparation encounters by recreating the actual touch and feel of true situations and exercises.

- *Intelligent Autonomous Systems*: Industry 5.0 depends vigorously on clever independent frameworks, which require modern man-made intelligence implanted inside programming specialists working in assembling offices. Not at all like the computerisation of Industry 3.0, independence in Industry 5.0 involves machines fit for carrying out complex roles freely, an accomplishment impossible without computer-based intelligence.
  State-of-the-art computer-based intelligence strategies, including grouping, relapse, bunching and profound learning, enable shrewd frameworks to go with choices independently, even in unexpected conditions. Move learning, a basic part of Industry 5.0, works with information and expertise to move from computerised to actual frameworks safely and powerfully, empowering variation in unique conditions.
- *Advances in Sensing Technologies and Machine Cognition*: The effectiveness of intelligent autonomous systems hinges on replicating human-like senses for cooperative learning and adaptive behaviour. Technologies such as computer vision, deep learning, reinforcement learning and GPU-based computation show promise in emulating primitive sensory capabilities. However, significant enhancements are required to meet the demands of Industry 5.0 cobots.

Human workers possess anticipatory behaviour, rooted in emotional intelligence, enabling them to detect potential hazards in the workspace. Current vision and cognition technologies fall short of replicating this capability (Wang et al., 2013). Machine cognition must evolve to enable informed decision-making in dynamic environments, a task that remains challenging given the limitations of existing technologies.

Notwithstanding vision and tangible advances, machine discernment should be expanded to recreate human administrators' reactions in assorted situations (Nguyen et al., 2015). Growing exceptionally versatile frameworks fit for knowing, and it is fundamental to answer developing working environment conditions. Be that as it may, accomplishing this degree of refinement presents considerable difficulties, as existing models, information and rule-based frameworks are deficient. Further headways in tactile advancements and examination systems are basic to reproduce human-like reactions precisely (Nguyen & Nahavandi, 2016).

Virtual preparation, astute independent frameworks and headways in detecting advancements and machine cognisance are fundamental parts of Industry 5.0. By utilising these advancements, makers can upgrade labour force preparation, streamline functional proficiency and encourage more secure and versatile workplaces (Kavousi-Fard et al., 2016). Notwithstanding, proceeding with innovative work is fundamental to beat existing restrictions and understand the maximum capacity of Industry 5.0.

The adoption of advanced technologies such as networked sensors, digital twins, shopfloor trackers and virtual training is essential for realizing the vision of Industry 5.0. By harnessing the power of these innovations, manufacturers can enhance productivity, optimise resource utilization and foster a collaborative environment where humans and machines work together synergistically (Shetty, 2017).

Even the seemingly straightforward task poses significant challenges for a cobot, as human operators typically make numerous decisions, both consciously and subconsciously, before executing such tasks (Khosravi et al., 2013). They assess the need for assistance, evaluate associated risks, consider safety factors and approach the task cautiously. Since cobots must collaborate with humans and other machines, they require similar decision-making mechanisms embedded within their systems. Achieving this necessitates advancements in perception, localization, vision, cognition and computational power in embedded platforms.

Recent advancements in deep learning, machine learning and embedded systems offer promising avenues for enhancing cobots' capabilities. Profound learning techniques, especially in mechanical and PC vision applications, have shown noteworthy execution, giving robots solid perception and representation capacities fundamental for independent activity, including cobots (Sulema, 2017). Profound learning methodologies influence counterfeit brain networks with different layers, known as profound brain organisations (DNNs). These calculations succeed with bigger volumes of preparing information, exhibiting further developed execution effectiveness as the dataset size expands (Khosravi et al., 2011). Not at all like customary learning strategies, which might arrive at immersion with inordinate preparation information, profound learning procedures keep on upgrading execution with more prominent information volume.

For instance: A common schematic of a multifaceted brain organisation, featuring the design of a DNN. The strength of profound learning lies in its versatility and flexibility to broad datasets, empowering cobots to learn and go with choices successfully in assorted conditions. As the field of profound learning keeps on developing, filled with progressions in computational power and algorithmic complexity, cobots are ready to accomplish exceptional degrees of independence and execution.

One more utilization of shrewd detecting includes using signals obtained from the human mind. This can be achieved through techniques such as electroencephalography (EEG), useful attractive reverberation imaging (fMRI), or utilitarian close infrared spectroscopy (fNIRS). Among these strategies, fNIRS stands apart for its movability and easy-to-understand nature, portrayed by quick arrangement times and underlying remote network for information transmission in most accessible headsets (Nguyen et al., 2014). These fNIRS headsets productively catch mind action and are relevant to a different exhibit of errands, including signal examination, expectation forecast and context-oriented mindfulness.

Industry 5.0, the following stage in the development of assembling, vows to upset creation frameworks around the world. Regardless of the incredulity among makers and industry pioneers, past modern transformations have shown a reliable pattern towards expanded efficiency and effectiveness (Zhou et al., 2015). Embracing Industry 5.0 requires the reception, normalisation and execution of new advancements, which thus require their own framework and improvement processes.

One of the key difficulties presented by Industry 5.0 lies in the domain of human–machine collaboration (HMI). As machines become coordinated into day-to-day existence all the more intently, cobots, or cooperative robots, will assume a huge part (Jordan & Mitchell, 2015). In contrast to customary machines, cobots show human-like functionalities, for example, holding, squeezing and communicating in light of aim and ecological variables. Subsequently, Industry 5.0 is supposed to create various open positions in the fields of HMI and computational human variables (HCF) examination (Kotsiantis, 2007).

A major part of Industry 5.0 is its capacity to robotise commonplace, perilous and tedious undertakings generally performed by human labourers. Wise robots and frameworks will pervade producing supply chains and shop floors, utilising progressed materials, improved battery packs, digital assault safe plan, powerful information dealing with processes (counting large information and computerised reasoning) and an organisation of smart sensors. This joining will bring about elevated efficiency, functional effectiveness, ecological supportability, diminished working environment wounds and more limited creation cycles.

Despite starting worries, Industry 5.0 is expected to make a greater number of occupations than it dislodges (Wickens et al., 2015). The expansion of wise frameworks will require jobs in computer-based intelligence and mechanical technology programming, upkeep, preparing, planning, reusing and the advancement of creative assembling robots. With redundant assignments mechanised, labourers can channel their imagination into the creation interaction, encouraging advancement and improving work environment elements (Goodrich & Schultz, 2007).

Moreover, the advent of Industry 5.0 will catalyze the emergence of numerous start-up companies specialising in custom robotic solutions, encompassing both hardware and software development (Hossny et al., 2010). This burgeoning ecosystem will not only stimulate economic growth but also facilitate cross-border collaboration and knowledge exchange, contributing to enhanced global competitiveness and increased cash flow worldwide.

Concerns in Industry 5.0

As we embrace the next industrial revolution, it becomes imperative to integrate high-value tasks into manufacturing policies, ensuring a harmonious relationship between technology, society and businesses through standardisation and legalisation measures.

However, it's crucial to acknowledge that certain segments of society, particularly senior members and stakeholders, may encounter challenges adapting to the changes of Industry 5.0. The rapid and highly efficient nature of manufacturing in this new era raises concerns about potential overproduction (Saleh et al., 2018). To mitigate this risk, transparency in implementation processes must be prioritised. Ethical considerations become paramount as autonomous systems take centre stage. It's fundamental to investigate how these frameworks can stick to moral standards, with an emphasis on creating arrangements that guarantee a reasonable moral way of behaving.