


Chapter 7

Algorithmic Hospitality: AI-Driven Personalization Across the Guest Journey

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ABSTRACT

Algorithmic hospitality represents a transformative shift in the hospitality industry, where artificial intelligence (AI)-driven algorithms are increasingly embedded across the guest journey to deliver personalized, efficient, and predictive service experiences. From pre-arrival search and booking to on-site service encounters and post-stay engagement, AI-enabled systems analyze large volumes of guest data to anticipate preferences, automate decision-making, and tailor interactions in real time. Technologies such as machine learning, recommender systems, chatbots, facial recognition, and dynamic pricing engines are redefining how hotels and tourism organizations understand and respond to guest needs. The algorithmic personalization enhances convenience, operational efficiency, and customer satisfaction; it also raises critical concerns related to data privacy, transparency, bias, and the diminishing role of human agency in service encounters. This chapter explores the conceptual foundations of algorithmic hospitality and AI-driven personalization.

INTRODUCTION

The hospitality business has never been out of personalized service philosophy, which consists of anticipating guest needs, and providing comfort, and unforgettable experiences. Personalization was traditionally greatly dependent on the human sense, experience, and human skills. Nonetheless, digitalization of hospitality, which is

DOI: 10.4018/979-8-3373-8197-8.ch007

triggered by artificial intelligence (AI), big data, the Internet of Things (IoT), and machine learning (ML) has introduced a new era called algorithmic hospitality. Within the framework of this paradigm, the data-driven algorithms are becoming an essential influence on how hospitality organizations perceive guests, design services, use resources, and are increasingly tailored. Algorithms and algorithms are used in algorithmic hospitality where AI-based algorithms analyze data about the guests and automate all these processes based on the guest journey, including inspiration and booking, on-site experience, and post-stay interactions. This is not only an upgrading of technology but the reconstruction of service logic, in which machines supplement or even substitute much of the human-based judgmental functions traditionally. The increasing demands of digitally native customers, especially Millennials and Gen Z have only intensified the applicability of algorithmic personalization. Visitors are now demanding excellent digital experiences, dynamic rates, real-time response services, curated advice, and custom experiences in various touchpoints. At the same time, hospitality organizations have pressures of increasing efficiency, maximizing revenue, boosting the productivity of staff, and staying competitive in an ever platform-based economy. The conceptual underpinnings of algorithmic hospitality, technologies that make it possible, its uses in various parts of the guest lifecycle, its strategic value, ethical issues, workforce issues, and directions of the field. In such a way, the chapter adds to the further insight of how algorithmic systems are transforming the delivery of hospitality services and the experience of guests.

Ideological Underpinning of Algorithmic Hospitality

Long-held service ideology, the traditional approach to personalization in hospitality has been based on a human-centered approach to service, in which the quality of the guest experience was strongly determined by the responsiveness, recall, emotional intelligence, and social skills of frontline employees (Al-Romeedy & Singh, 2025a). We focused on the personalized service. face-to-face interactions enabled staff to remember the names of repeat guests, note their room preferences, dining habits, and tailored service experience with observational and first-hand knowledge. Guest histories used to be kept in a manual form in guest comment cards, rudimentary property management systems or simply through informal departmental communication. Loyalty programs were premised on general segmentation strategies according to frequency of stay or amount of spending, and provided standard incentives, as opposed to personalized interaction. Although full of emotional warmth and authenticity, this personalization model was also inherently of restricted scope, consistency, and predictability: it was based on the human memory, manual record-keeping, and data systems fragments. Hospitality personalization has fundamentally changed with the swift development of artificial intelligence, machine learning, and big data analytics

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