Artificial Intelligence in Hospitality: Transforming Services, Experience and Efficiency

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Academic Contributors

Dr. Meng-Mei Maggie Chen is an Associate Professor of Marketing at EHL teaching hotel distribution strategy, online consumer behavior, marketing strategy and digital marketing courses. Before entering higher education, Maggie held positions in various tourism sectors, ranging from hotels to casinos, travel agencies, and consulting.

Dr. Alessandro Inversini is a Full Professor at the EHL. He is an expert in digital communication and his research focuses on the role of digital transformation in society. He has extensive international academic experience, having worked at Università della Svizzera italiana, Bournemouth University, and Henley Business School (University of Reading) before joining EHL.

Ronald Sone is a Research Assistant at EHL. He holds an MSc in Business Administration from HES-SO and before joining EHL, he worked as a business data processing specialist. His areas of interest and expertise include Entrepreneurship, Innovation, Sustainability, Generative AI, Change Management and Hospitality.

Amélie Keller is the Project Coordinator of the Flagship Resilient Tourism initiative - a CHF 5.5 million project supported by Innosuisse, involving 6 Swiss academic partners and 32 partners from the Swiss travel sector. She also manages a regional coaching program and advises local tourism stakeholders in their digital transformation.

Academic Contributors

Dr. Cindy Heo is an Associate Professor of Revenue Management at the EHL. Prior to joining EHL, she taught a revenue management course at the Hong Kong Polytechnic University and has delivered custom executive education programs on revenue management in Asia, Middle East, and Europe.

Dr. Bertrand Audrin is assistant professor in Human Resource Management and Organizational Behavior at EHL Business School. His research focuses on digital transformation and its impact on organizations, human resource management, and employment relationships. His current projects tackle questions on digital skills and emotional intelligence, new ways of working and AI for recruitment.

Dr. Valentina Clergue is an experienced senior researcher with interests pertaining to branding, advertising, and sustainable consumption, teaching courses in Marketing, Brand Management and E-Marketing at EHL. In addition, she worked in the advertising industry for more than five years. She conducted advertising campaigns for clients such as Cisco, Danone, Jeff de Bruges, and DHL among others.

Dr. Jean-Philippe Weisskopf is an Associate Professor of finance at EHL and managing director of a small international hotel group. He holds a PhD from the University of Fribourg (Switzerland) and has worked in private banking. His research interests include empirical corporate finance, family-owned businesses, and wine economics.

Dr. Nicole Hinrichs is Full Professor of Strategy and Entrepreneurship and Associate Dean Degree Programs at EHL Hospitality Business School. She is also a member of the EMBA faculty at EPFL Lausanne and a Visiting Reader at Imperial College London. She gained academic experience at Columbia Business School (USA), Wharton Business School (USA), and the Swiss Federal Institute of Technology Zurich, ETH (Switzerland).

Professional Contributors

Miguel Plantier is the COO of Sublime Hotels and General Manager of Sublime Comporta. He has extensive international experience in luxury hospitality, leading hotel operations and projects across Europe with a focus on excellence, people and innovation.

Claudia Beaufort is Chief Commercial Officer at Zermatt Hospitality Group, one of the largest hospitality enterprises in Switzerland. Previously, she worked in various technology enterprises in the hospitality and tourism sectors in Switzerland and the UK. She has an MBA in hospitality from EHL and continues her own AI-related development.

David Frei, General Manager of GRACE LA MARGNA ST MORITZ, studied at the École hôtelière de Lausanne and built his career with renowned international luxury hotels. After leadership roles in Switzerland and abroad, he spearheaded the transformation of La Margna into a five-star superior property, combining heritage with contemporary hospitality excellence.

Why a Whitepaper on Artificial Intelligence and Hospitality?

Over the past few years, we have met many hoteliers seeking our opinion on the rise and use of Artificial Intelligence (AI) in hospitality. Our responses were limited to some insights drawn from our practices since we did not possess a comprehensive understanding of the broader AI landscape within the hospitality industry. At the same time, we asked ourselves: How could we establish a meaningful multi-perspective discussion about AI in hospitality? To address this, we gathered initial insights from various sources to develop a critical understanding of AI's role in the hospitality sector. Then, we brought our colleagues and hoteliers together to conceive a comprehensive overview of the use of AI in hospitality today.

What Will You Find Inside?

In the next few pages, we collected (i) statistics about AI, (ii) outlined companies active in the AI hospitality field, (iii) opinions of our colleagues and (iv) the perspectives of leading Swiss hoteliers. The result is a first attempt to generate a critical understanding of AI in hospitality using different lenses, which reflects EHL's unique blend of academia and practice.

Who Is This Whitepaper For?

This whitepaper is for curious people who want to gain a better understanding of AI in hospitality. It is the first edition, and we are keen on updating it to create a critical sounding board for anyone interested in adopting AI in hospitality.

Questions? Doubts? Get in touch!

Did we miss anything? Please let us know!

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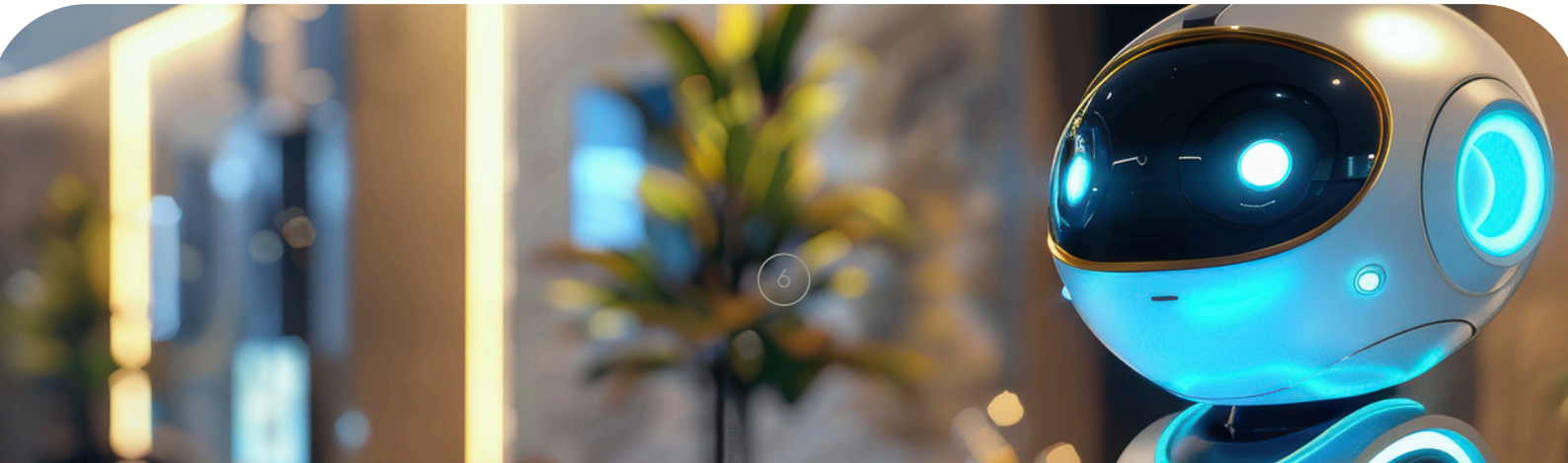
Introduction

There is no doubt that AI is the hottest trend today, not just because it is new, but because of the endless opportunities it offers. Hospitality practitioners appreciate the convenience and intelligence that it provides. With a few prompts, AI can generate convincing marketing texts, create songs and images, produce podcasts, and create videos, myriad other things.

Everyone brags about what AI has done for them. At the same time, hospitality practitioners also wonder how AI will impact their jobs. The Future of Jobs Survey 2025 found that 86% of employers expect AI and information processing technologies to transform their businesses by 2030 [1]. However, how this transformation would be perceived is unknown. The report also showed that almost half of the organizations that participated in the study expect to reorient their business models toward new AI-driven opportunities (49%), while 47% plan to transition employees from AI-disrupted roles to other positions. While most employers plan to hire new people with AI-relevant skills, a significant share (41%) also expect to downsize their workforce as AI capabilities expand to replicate roles [1].

AI Development in Hospitality

As the hospitality industry increasingly navigates the integration of artificial intelligence, hoteliers are recognizing its transformative potential. A recent survey indicates that 73% of 327 hospitality professionals worldwide agree that AI will have a significant impact on the sector [2]. In this context, most technology vendors claim that their AI products are the best solution for "chronic problems" like guest management & profiling, revenue optimization, operations, etc. Major hospitality and tourism players have also jumped on the bandwagon and announced their new AI initiatives. For example, across the Wyndham portfolio, hoteliers rely on Wyndham Connect, powered by Canary AI, the guest engagement platform that enhances the guest experience while streamlining owner operations to engage guests with personalized responses automatically and upsell offers [2]. Best Western's Guest Management System, also powered by Canary AI, leverages the most substantial hospitality-specific AI model in the industry, facilitating guest engagement across multiple touchpoints with automation and personalization, improving experiences, increasing revenue and simplifying staff operations [2].



Hilton's Connie, which is powered by IBM Watson's AI, acts as a concierge, assisting guests with information about hotel amenities, dining recommendations and local attractions. Similarly, Marriott International has experimented with AI-powered assistants in rooms that allow guests to control room settings, including lighting temperature and entertainment systems through voice commands [3]. The implementation of these AI technologies in hotels has played a substantial role in improving guest satisfaction and experience, while simultaneously streamlining hotel operations.

However, while Generative AI is new, AI itself is not. Before the Generative AI buzz, we already used "AI" in our daily lives, although it was not branded as such. For example, our GPS loudly announces every wrong turn by repeating 'recalculating, recalculating'. Amazon and Netflix provided AI-enabled personalized recommendations. Some hotels and airlines had already used chatbots in their customer service before Generative AI became omnipresent.

Due to this excitement and anxiety around AI, we decided to take a snapshot of AI usage in the hospitality industry. We aimed to demystify the AI buzz through a multilateral approach. Firstly, we made an inventory of the popular AI-embedded technologies in the hospitality industry. These providers declared on their websites that their products have AI, although the details and functions of AI may vary dramatically from one provider to another. Secondly, we invited our academic colleagues to provide an update in their domains (revenue management, marketing, human resources, finance, operations, and strategy). In conclusion, we presented our reflections alongside the perspectives provided by the hotel industry experts.

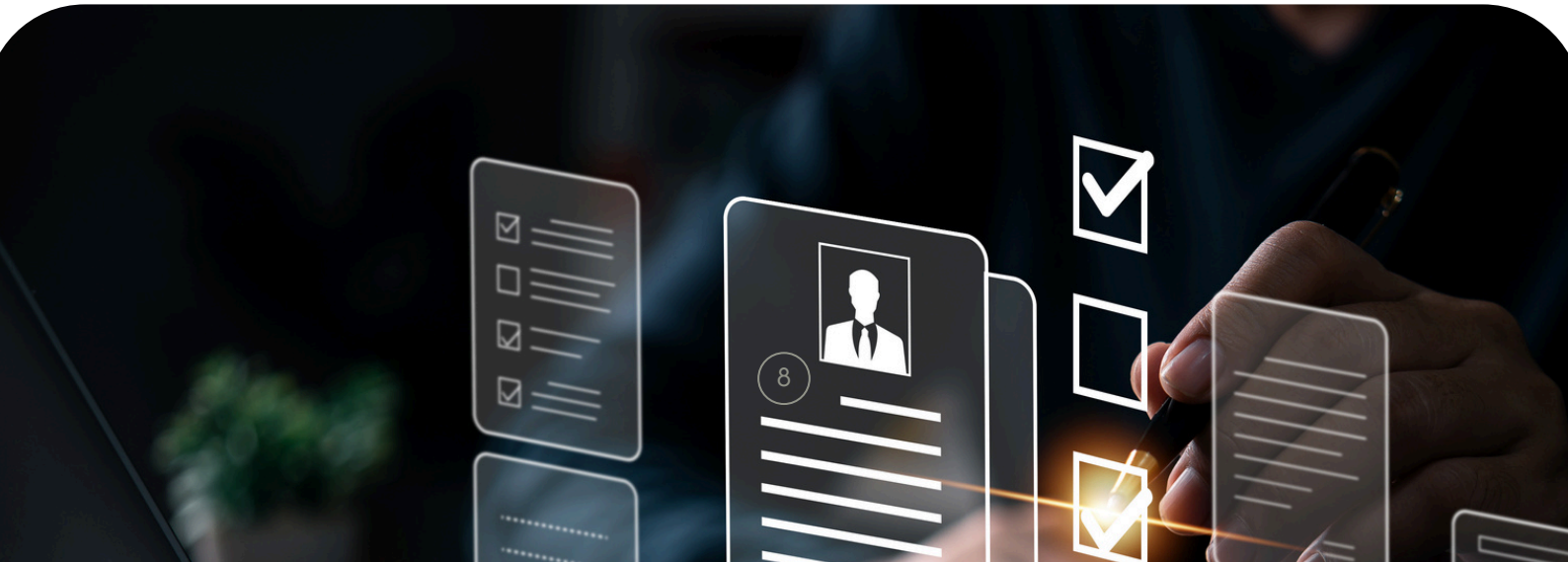
A Fast Oligopoly Vs. a Slow Fragmented Market

Why do we take this approach?

We have sensed a dramatic contrast between generative AI and other hospitality technologies. We call it fast oligopoly vs. a slow fragmented market. ChatGPT from OpenAI broke the adoption record by reaching 100 million users within just two months of its release. After ChatGPT, different generative AIs sprang up everywhere. These generative AIs evolve fast and are getting stronger every day. Both the adoption rate and the product evolution convince us that Generative AI is fast.

Interestingly, small independent hospitality players normally cannot afford the latest technologies. Yet, Generative AI is accessible to anyone for free or with a reasonable subscription package. Hence, we cannot take a snapshot of the AI usage in the hospitality industry without considering Generative AI. On the contrary, the adoption rate and product evolution for hospitality technology are much slower than those of Generative AI. We can attribute the slowness to the lack of financial and human resources for hoteliers and hospitality technology firms. Consequently, we have noticed different market compositions between Generative AI and AI-embedded hospitality technology. Although new Generative AI firms pop up all the time, a few major players (ChatGPT, Claude, Gemini, etc.) dominate the market, forming an oligopoly.

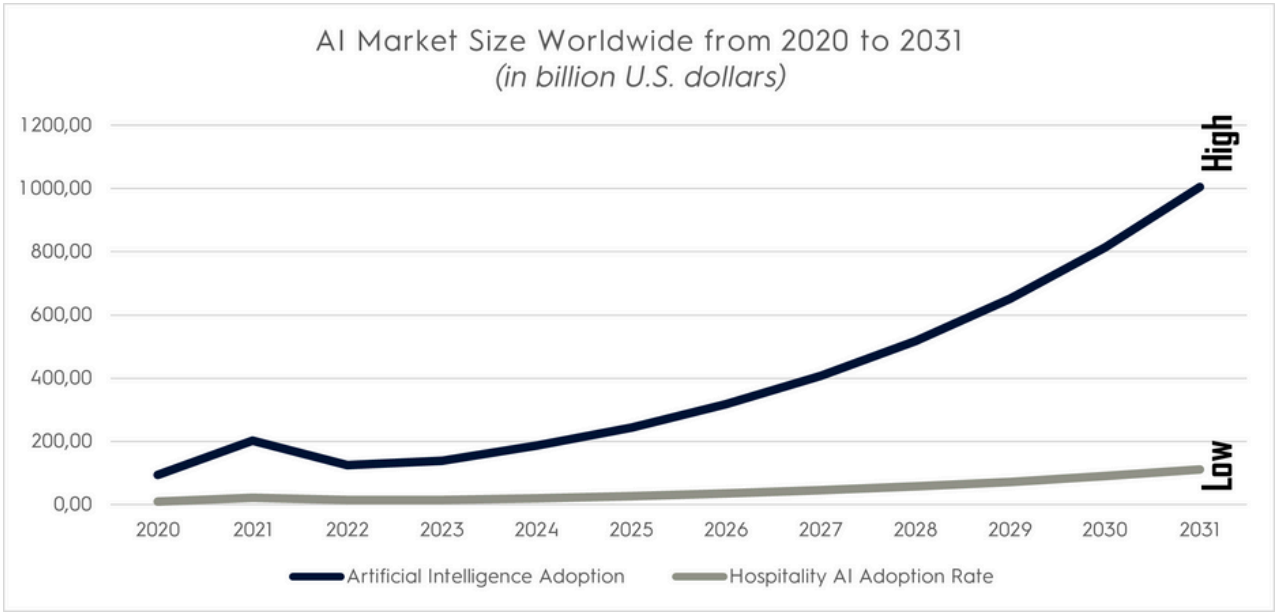
Alternatively, just like the hospitality industry, hospitality technologies are also fragmented. Although property management systems, revenue management, channel manager, and review management systems are obvious must-have hospitality technologies, the major players in these areas do not necessarily control the major market share. Small technological players competently serve small independent hotels, with little financial and human resources to achieve an innovative breakthrough. This may imply that, although the hospitality technology industry is fragmented, given the limited resources available to small players, we can focus on major players to monitor AI adoptions in hospitality technologies.



We hypothesize that the adoption rate of generative AI and AI-embedded hospitality technology will be very different as shown below (Figure 1)

We also believe the relationship between generative AI and users will be a direct (or B2C) approach, while AI-embedded hospitality technology and users will have an indirect (or B2B) approach. In other words, in the Generative AI scenario, AI will interact with end users directly. In contrast, in the AI-embedded hospitality technology scenario, AI will interact indirectly with users through hospitality technology. When a hotelier wants to implement AI for his revenue management, it is more likely that he will buy a revenue management system that includes AI capability, instead of implementing AI directly. His employees will use AI that is embedded in the revenue management system. For this reason, we call this approach an indirect (or B2B) approach.

Figure 1: Adoption Rate of Generative AI and AI-embedded Hospitality Technology



The Use of Artificial Intelligence Technologies in the European Union (EU)

EU businesses use AI software or systems for different purposes. In 2024, 34.08% of enterprises using AI technologies used these software or systems for marketing or sales and 27.51% for the organization of business administration processes or management [4]. The biggest difference between small and large enterprises was recorded for those that used AI software or systems for ICT security (46.44% large enterprises, 17.19% small enterprises), followed by those which used them for production processes (34.65% large enterprises, 21.62% small enterprises) and those that used them for logistics (15.85% large enterprises, 4.48% small enterprises) [4] as seen below (Figure 2). A total of 13.48% of businesses in the EU, with 10 or more employees and self-employed persons, used at least one of the following AI technologies [4]:

- technologies analysing written language (text mining)
- technologies converting spoken language into a machine-readable format (speech recognition)
- technologies generating written or spoken language (natural language generation)
- technologies identifying objects or people based on images (image recognition, image processing)
- machine learning (e.g. deep learning) for data analysis
- technologies automating different workflows or assisting in decision-making (AI based software robotic process automation)

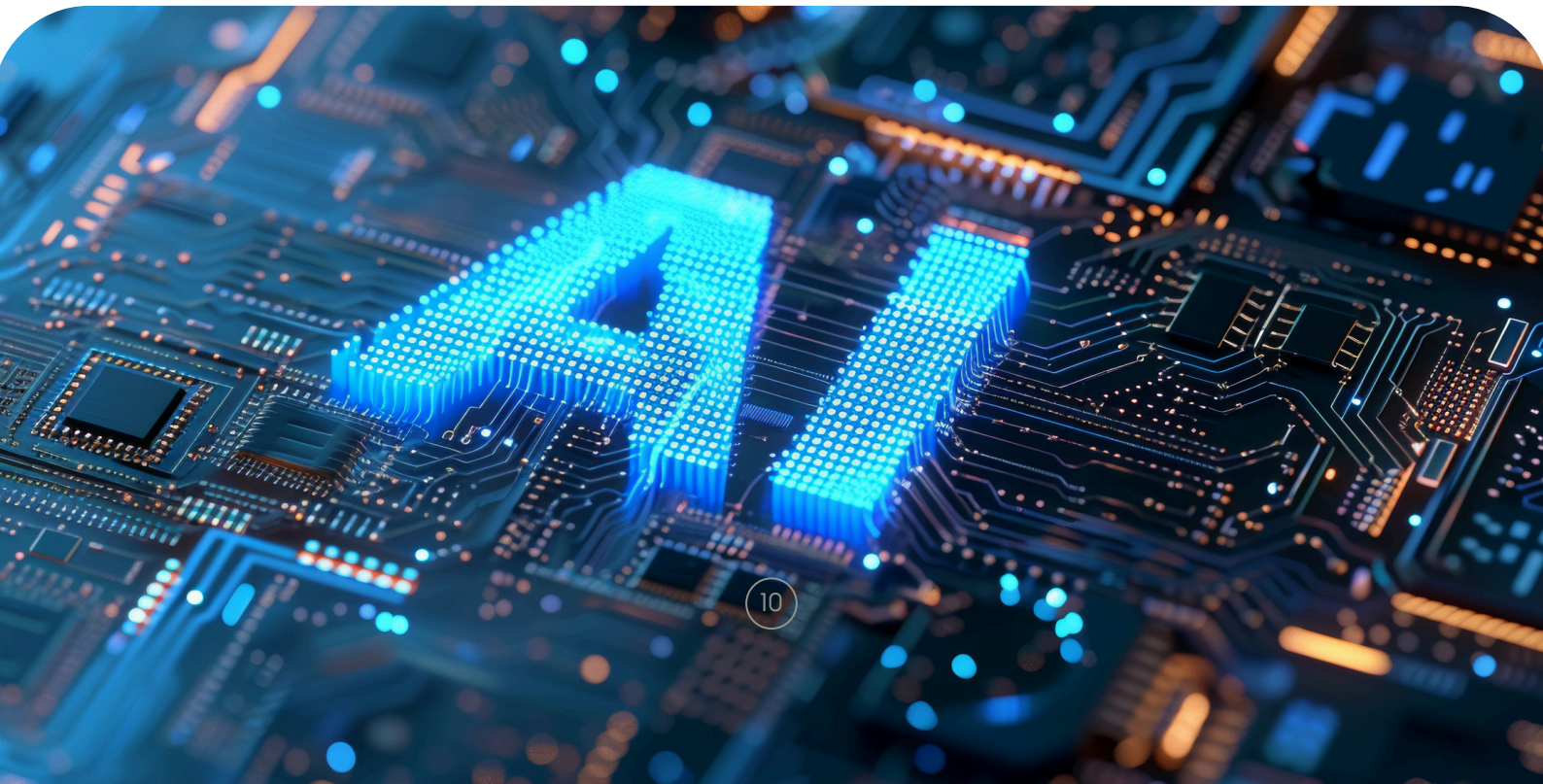
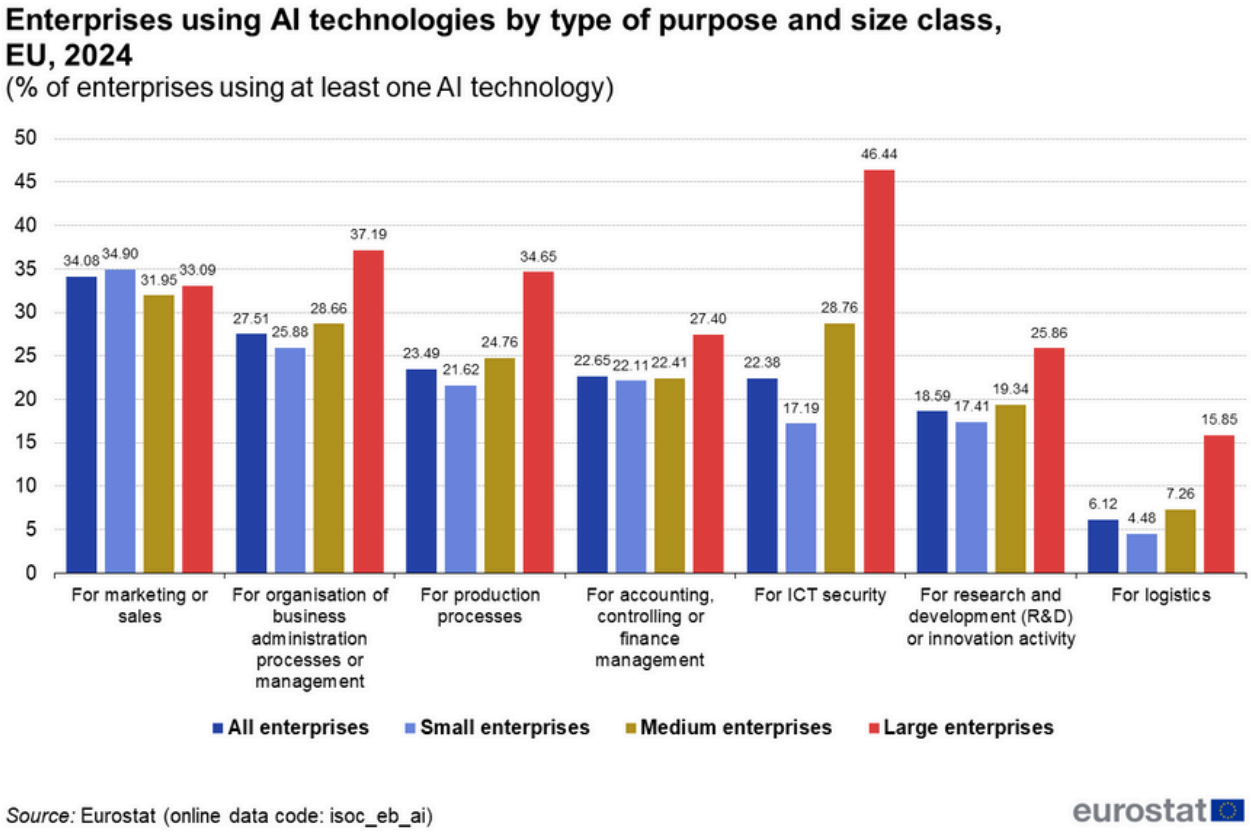


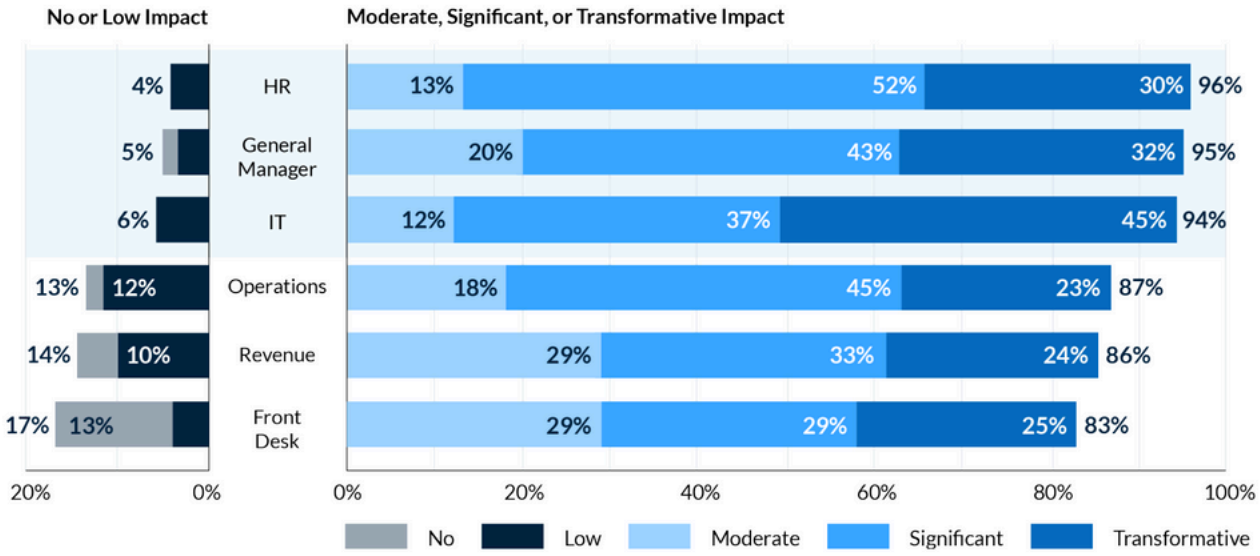
Figure 2: Enterprises Using AI Technologies by Type of Purpose and Size Class, EU, 2024 (Source: Eurostat (isoc_eb_ai))



Where Is AI Impacting Hospitality?

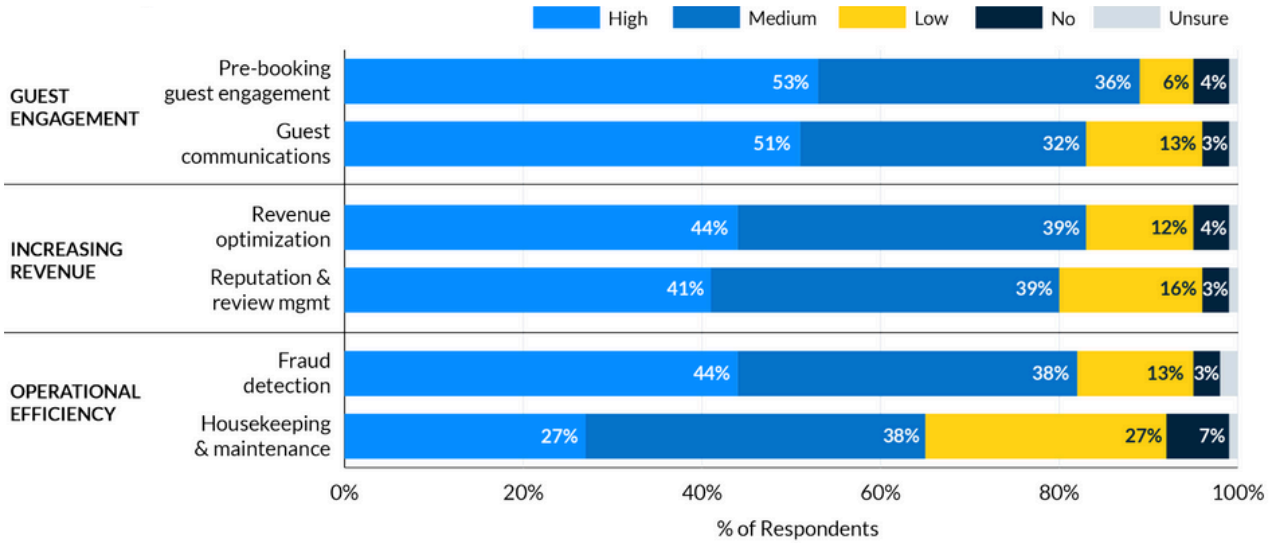
A study by Canary Technology in 2024 with 327 individuals (General Managers, IT, Operations, Front Desk, HR & Finance) responsible for IT purchasing decisions in the hospitality industry overwhelmingly agreed that AI is set to transform the industry [2]. HR, General Managers and IT professionals are the most optimistic about AI's impact, with 94% or more believing AI will have a significant, transformative or moderate impact on the industry [2]. Below is a summary of the findings on the impact of AI in the hospitality industry (Figure 3). Over 80% of respondents believe AI will significantly reshape pre-booking interactions and guest communications, setting the stage for more personalized, seamless connections with travelers [2] as shown in Figure 4.

Figure 3: AI Impact on Hospitality by Function



Source: Canary Technologies, "Navigating AI: Emerging Trends in Hospitality," 2025

Figure 4: AI Areas of Impact



Source: Canary Technologies, "Navigating AI: Emerging Trends in Hospitality," 2025

As seen above, there is a tremendous optimism surrounding the impact of AI in hospitality; however, the question we really have to ask as a bridge between academia and practitioners is when and how will this impact materialize on a large scale? How effective and efficient will it be? How does AI fit into the overall business strategy and guest experience vision? Are guests likely to accept and trust AI-driven services? If the promise of AI in hospitality lies in its ability to generate intelligent, automated guest responses through chatbots (hereby allowing front desk staff to focus on other tasks), revenue generation, increasing bookings, and providing multilingual support to address guest inquiries in their preferred languages, then this innovation will be overwhelmingly positive for both clients and hoteliers. By addressing these longstanding challenges (multilingual support, generating intelligent automated guest responses through chatbots, etc) in the industry efficiently, AI would create mutually beneficial outcomes for all parties involved.

Nevertheless, the transformative potential of AI in hospitality will, unfortunately, not be evenly utilized by different hospitality accommodations due to the resources required to effectively and efficiently implement it. This is because AI budget allocations tend to rise in proportion to the size of the property. At least two-thirds of hotels with 150 rooms or more are setting aside 10% or more of their IT budget to AI tools; 26% of properties with more than 500 rooms are allocating over half of their IT budget to AI-enabled solutions [2]. While other accommodation businesses do not even possess an IT department.

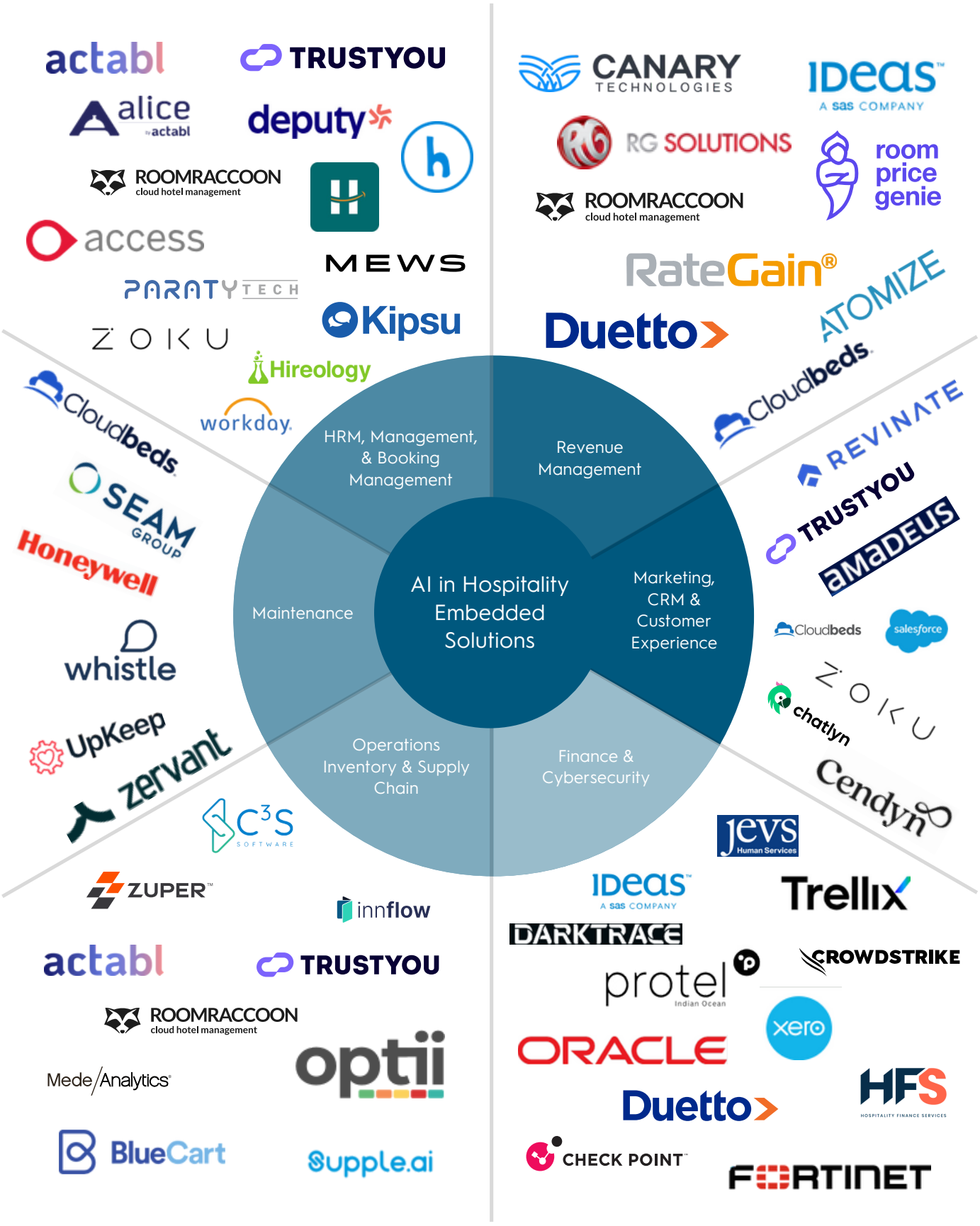
An Inventory of AI-Embedded Hospitality Technology

AI solutions have significantly transformed the hospitality industry from the inside out, enhancing guest experiences and improving operational efficiency. As technology continues to advance, the integration of increasingly sophisticated systems will further shape travel, leisure, and dining practices. For industry stakeholders, keeping pace with new AI developments is essential for maintaining competitiveness in a rapidly evolving market.

With respect to the previous Diffusion of Innovation Models [5] where technology adoption represented a deliberate human decision, with users exercising conscious agency in choosing whether to embrace an innovation or not, AI is entering our daily professional life differently; in fact, most AI technologies (from generative to analytical) are embedded in new but above all old software that when updated unleashes sophisticated AI functionalities.

Figure 5 shows the current scenario (September 2025) of AI vendors for hospitality with established and rising companies; the landscape is complex and constantly changing. It is important to acknowledge that certain AI solutions are employed across multiple sectors; due to space constraints, these have not been listed again if previously referenced.

Figure 5: An Inventory of AI-Embedded Hospitality Technology



Source: Our research output September 2025

Updates From Academia

After reviewing industry trends, we asked our colleagues at EHL Hospitality Business School for their point of view on their respective research fields and how AI is influencing hospitality at various levels. The following contributions will address the following topics: Revenue Management, Human Resources, Marketing, Strategy & Innovation and Finance.

Revenue Management

AI in Revenue Management

Dr. Cindy Heo
Associate Professor

AI has revolutionized Revenue Management (RM) by allowing businesses to leverage data-driven insights with unprecedented accuracy and speed. RM was the first major function to deploy advanced analytics at scale in the travel sector, with practices like dynamic pricing now an industry standard. Unlike traditional RM approaches that rely on manual analysis, spreadsheets, and limited historical data, AI-powered RM systems use advanced machine learning algorithms to analyze vast datasets, identify trends, and predict future demand. By incorporating variables such as market trends, competitor pricing, customer behavior, and historical booking patterns, AI generates real-time insights, enabling businesses to dynamically adjust pricing strategies and optimize resources for maximum profitability. The importance of AI in RM lies in its ability to process vast amounts of data far faster and more accurately than traditional methods. By eliminating human bias and reliance on static pricing models, AI ensures pricing decisions are both timely and data-driven. This capability is particularly critical in industries like hospitality and transportation, where market conditions can shift rapidly, and consumer behavior varies widely.

Traditional RM approaches were often reactive, relying on periodic reviews of past performance and static pricing models. These methods could not adapt quickly to real-time changes in complex market conditions or customer behavior, leading to missed opportunities or inefficiencies. In contrast, AI-powered tools continuously analyze data and respond to fluctuations in demand, ensuring optimal pricing at all times. For example, AI can instantly detect surges in demand due to a major event or unforeseen circumstances, such as weather changes, and adjust pricing accordingly.

For instance, airline companies utilize AI to dynamically adjust ticket prices based on factors such as not only booking patterns and seat availability, but also market demand and competitor's price changes [6]. Similarly, ride-sharing companies like Uber employ AI algorithms to implement dynamic pricing, ensuring maximum utilization of their fleet while balancing supply and demand [7].

Revenue Management in the Hospitality Industry

In the hospitality sector, AI has been revolutionary in optimizing dynamic pricing and inventory. While traditional revenue management systems effectively utilized available data to inform pricing and inventory decisions, the integration of AI has exponentially enhanced these capabilities. AI enables real-time data processing, more accurate demand forecasting, dynamic pricing optimization, and personalized customer interactions, leading to improved revenue outcomes in the hospitality industry. Accurate demand forecasting and predicting booking cancelations are particularly crucial for a successful RM strategy, and advances in predictive analytics have significantly improved forecasting accuracy. Several studies [8] have demonstrated that demand forecasting methods using machine learning (ML) can reduce forecasting errors compared to traditional additive pick-up models.

Major Revenue Management Solution (RMS), such as IDeaS Revenue Solutions and Duetto, widely adopted by leading hotel chains like Marriott International and Accor, are integrating AI to enable real-time dynamic pricing. These systems analyze variables such as room availability, competitor rates, and booking trends to optimize pricing strategies. Additionally, technology start-ups are leveraging self-learning algorithms that utilize historical data from millions of searches to predict future price movements. These predictions are based on multiple factors, including seasonal trends, demand growth, limited-time special offers, consumer preferences, and purchase patterns.

However, AI-powered RMS tools primarily focus on optimizing room rates and inventory allocation to enhance Revenue Per Available Room (RevPAR). While this is an important metric, the narrow focus on room rate optimization overlooks other significant revenue streams, such as food and beverage sales, meeting and event spaces, spa services, and ancillary offerings. A major challenge is that even leading hotel chains often operate disparate systems, including RMS, PMS (Property Management Systems), CRM (Customer Relationship Management), CMS (Channel Management System), and POS (Point of Sale) systems.

These systems are typically provided by different software vendors and function independently, creating data silos. This lack of integration prevents the seamless flow of information across hotel operations, limiting the effectiveness of AI-driven insights, which depend on comprehensive data to generate holistic and actionable recommendations.

The Future of AI in Revenue Management in the Hospitality Industry

AI-powered RMS have primarily been adopted by large hotel chains with financial resources to invest in advanced technologies. These systems, which require substantial investment and infrastructure, often remain inaccessible to small and medium-sized hotels. However, technological advancements are paving the way for more inclusive solutions. The development of unified platforms based on multi-agent systems designed to integrate various hotel operations seamlessly has the potential to replace fragmented systems. As these unified solutions become more sophisticated and cost-effective they are expected to lower barriers to adoption, enabling smaller hotels to access AI-powered tools without requiring extensive resources.

In addition to improving accessibility, these unified platforms will enable more comprehensive data analytics. By consolidating data across all operational areas, such systems can generate holistic and actionable insights to maximize overall profitability. AI is also evolving beyond traditional revenue management tasks such as demand forecasting, dynamic pricing, and inventory optimization. For example, the next generation of AI-powered hospitality intelligence systems will recommend targeted marketing campaigns to enhance conversion rates and suggest personalized promotions to in-house guests, thereby maximizing ancillary revenue throughout their stay. Achieving these advanced capabilities requires AI to process diverse data inputs, including natural language processing, facial recognition, and video analytics. For instance, insights generated by AI chatbots will play a pivotal role in personalizing real-time services to align with guest preferences, thereby driving revenue growth. Large language models (LLMs) further elevate AI systems by streamlining interactions, making them more intuitive, accessible, and user-friendly for both guests and staff.

As AI-based hospitality intelligence systems become the industry standard, competition may shift to AI-versus-AI scenarios. In such a future, human creativity will be essential. The ability to design experiences that go beyond AI capabilities and fulfill deeper, more intricate experiential demands will redefine innovation in the hospitality industry. This will underscore the critical role of human ingenuity alongside technological advancements.

Human Resource Management (HRM)

AI in Human Resource Management

Dr. Bertrand Audrin
Assistant Professor

AI has had a strong impact throughout the whole employee lifecycle, from talent acquisition to development and performance, to retention and/or separation. Research has highlighted three main areas of interest, namely recruitment, training & development, and compensation & benefits [9]. Recruitment and selection have been transformed with the integration of AI in Applicant Tracking Systems (ATS). AI is increasingly used in the extraction and matching of skills between candidates and job offers, although many different types of algorithms compete, yielding different results [10] .

Further uses in the selection process have emerged, from asynchronous or synchronous AI-powered video interviews to chatbots. AI also strongly impacts workforce allocation through similar skills matching approaches that help foster a more dynamic staffing, be it in project work or in day-to-day activities. Training and development have been transformed with the integration of AI in Learning Management Systems (LMS) and the increased use of chatbots for training. AI is increasingly used to craft customized training programs that match both organizations' requirements in terms of skills and employees' career expectations. Conversational Large Language Models are also used to build customized training chatbots for specific requirements within an organization [11]. Finally, compensation and benefits is also an area that has known tremendous changes with AI, on both sides of the function. AI is being used to develop more consistent pay systems, with challenges and opportunities in terms of fairness and explainability [12]. AI is also increasingly being used to enable mental wellbeing, through specific chatbots and wellbeing applications that are offered to employees [13]. AI is also being used in other parts of the employee lifecycle (onboarding, performance evaluation, offboarding, to name a few), but the changes have been less impactful so far.

How is AI Applied in HRM in the Hospitality Industry?

HRM in hospitality, like in any other industry, has been strongly impacted by AI. Many initiatives have leveraged AI to tackle various tailored challenges specific to hospitality, throughout the whole employee experience. At the recruitment and selection stage, Hospitaliti.io stands out. The platform aims to optimize the hiring process with AI and to connect candidates with organizations seamlessly. Another platform also active in selection is Harri, although Harri serves a broader purpose in later stages of the employee lifecycle than that of workforce management system. More specifically, it uses AI to facilitate staffing and scheduling of frontline employees.

Finally, one platform that seems particularly promising for staffing and reskilling is Para Ti. Its goal is to help bring marginalized people back into employment, with a focus on AI upskilling. The goal here is to ensure continuity in the workforce by retraining, through AI, potential employees who would not have been considered traditionally. As highlighted, there are many developments of HRM specific to hospitality [14]. The three platforms presented show a focus on skills, which is consistent with the current transition from full-fledged positions to bundles of skills [15] [16]. AI helps bring a more precise understanding of the skills that are required in an organization and a more dynamic way to acquire them, train for them, and make sure that people with relevant skills are indeed present when needed. In that respect, AI enables a more flexible way to manage human resources, which is critical in an industry as dynamic as hospitality.

The Future of an AI-empowered HRM System in the Hospitality Industry.

AI-empowered HRM in hospitality is still in its nascent phase, although the three platforms presented hereabove offer interesting avenues for future developments. The generalization of AI tools for selection, upskilling and staffing could be seen as the initial step towards a more globalized skills-based approach to talent management in hospitality. AI in that respect would serve as an enabler that identifies precisely the challenges and opportunities in terms of skills. Another area that would benefit from further developments in the specific hospitality sector is that of employee wellbeing and organizational support. As hospitality requires a high volume of emotional labor, employees would benefit from tailored solutions to cope with this burden, beyond the traditional well-being that already exists. In that respect, specific AI tools could play a critical role in understanding the needs of hospitality employees and supporting them, from a mental health perspective. Recent research on AI-powered agents has shown interesting results in personalization and emotional connection. This form of support could lead to increased employee satisfaction and engagement, as well as higher employee retention.

Nonetheless, some cardinal questions remain when it comes to the use of AI for people management, specifically in terms of accuracy and fairness, ethics, and collaboration [17]. The first question points to the importance of building AI systems that are fair and transparent to avoid bias and misunderstanding of organizations' realities, which would in turn negatively impact employees' motivation. The second point emphasizes the importance of keeping in mind the ethical challenges associated with AI at stake, notably when it is bound to make (or suggest) decisions that can be crucial in someone's life (hiring, promoting, laying off, etc.). The third point refers to the ambition of creating an environment that fosters collaboration between AI and humans, acknowledging the challenges of isolation and employee empowerment in an AI-driven world.

Marketing

AI in Marketing

Dr. Valentina Clergue
Assistant Professor

AI is a tool that can enhance business decision-making, automate processes, and deliver personalized customer experiences. In marketing, AI is found in digital marketing, content marketing, and customer engagement. For example, in digital marketing AI is used in search, recommendation systems, and programmatic advertising and allows marketers to target consumers more effectively based on their preferences and past behavior [18] [19]. In content marketing, AI is used to generate personalized content through natural language processing [20]. Additionally, AI improves customer interactions and thus overall customer engagement by employing voice recognition, virtual transformation, and image recognition technologies [21] [22] [23].

Recent advancements in cognitive analytics and machine learning allow marketers to process large amounts of unstructured data and identify patterns that can predict future customer behavior [24]. Generally, AI has the potential to optimize marketing operations by automating repetitive tasks such as email campaigns, freeing marketers to focus on strategic activities [25]. In market research, predictive analytics and sentiment analysis enable businesses to analyze customer feedback and trends in real-time, which are then used for targeted marketing strategies [26] [27] [28].

How is AI Used in Hospitality Marketing?

In hospitality, AI enables personalized customer interactions and enhanced engagement and provides predictive analytics. AI-driven tools such as chatbots, recommendation systems, and sentiment analysis offer real-time, tailored services that improve guest experiences and loyalty [29]. Marketing automation through AI allows hospitality providers to segment customers based on preferences, enabling targeted promotions and offers [30] [31]. Additionally, AI helps with the development of virtual agents and conversational interfaces, which enhance customer support [32]. Hospitality professionals can create seamless customer journeys by predicting customer preferences and automating routine interactions [33]. By analyzing customer feedback and online reviews, AI identifies trends and gaps in service delivery which can be used to make service improvements and deliver marketing campaigns [34]. Despite its potential, AI adoption in hospitality marketing also has challenges related to privacy, ethical considerations, and the need for human contact to ensure meaningful customer interactions [35]. Balancing the use of AI with human-centric interactions is crucial for maintaining meaningful guest engagement.

The Future of AI in Hospitality Marketing

AI is moving beyond automating tasks and will be able to handle complex, human-like functions such as empathetic support. AI technologies will potentially interpret emotional cues and respond empathetically, enhancing relationships between customers and brands and fostering deeper customer engagement [36]. In hospitality, AI is expected to continue to change customer interactions by enabling hyper-personalized experiences. Such capabilities will help marketers predict customer needs even better and deliver hyper-personalized campaigns that improve customer engagement and satisfaction [25] [37]. Generative AI tools will transform content creation, making marketing messages more targeted and dynamic [31]. AI-driven predictive analytics will also enhance demand forecasting and dynamic pricing, optimizing revenue management strategies [19]. Cognitive AI will be able to process complex, human-like functions, improving marketers' ability to engage with customers [24]. AI-powered tools in hospitality can create seamless, interactive experiences across booking platforms and customer service channels [38]. However, it is important to note that AI raises concerns over privacy, trust, and bias, which makes it crucial for companies to develop ethical frameworks to safeguard customer relationships [35] [33].

Strategy & Innovation

AI in Strategy & Innovation

Dr. Nicole Hinrichs
Full Professor

Pursing innovations, particularly when supported by technological infrastructure, has developed into a key ability for organizations/firms to succeed and remain competitive [39][40]. The classical depiction of incumbent organizations threatened by new entrants has potentially been upended with the advent of AI. Recently, AI is increasingly being used for upstream innovation activities not thought possible [41] potentially reducing its associated risks. In multiple studies recently conducted, evidence shows that AI is starting to operate as a vital stakeholder in the strategic decision-making process [42].While findings remain focused on different stages of the strategy process (e.g., ideation, analysis, selection, execution) the findings support value in the integration of AI. In a recent study [43], the results provided evidence that suggest that AI has the potential to not only enhance the speed and quality of the analysis, but also facilitate more complex strategic analysis that hinges on innovative tools, such as virtual strategy simulations.

Still, the integration of AI is not a silver bullet to strategy development. A recent study [44] revealed that AI technologies have the potential to enhance the ideation process, but their opacity can hinder effective integration into decision-making. The field study revealed that professionals only achieved effective "engaged augmentation" when they actively interrogated AI outputs, while in other cases, the lack of transparency led to increased uncertainty and limited adoption of AI inputs.

How is AI Used in Strategy & Innovation in the Hospitality Industry ?

At present, the potential of AI is outpacing the ability of implementing AI in the hospitality industry with the areas of adoption still vastly concentrating on the operational side of customer experiences. The first wave of adoption has seen most of the application at the front end of hospitality, defined as the customer-facing operations. Whether it is virtual assistants or AI-powered chatbots, the implementation is geared towards providing support and addressing queries, resolving issues in real time 24/7, thereby improving convenience and customer satisfaction. In a second wave that is currently unfolding, we identify a widening application towards the guest experience. AI-driven tools are predicted to drive a heightened experience customization, based on customer data (e.g., booking history, feedback, or prices sensitivity), that allow hospitality organizations to tailor recommendations, room settings, or food and beverage choices. Through an anticipatory approach to hospitality offerings, organizations can create seamless and memorable guest experience, while overarchingly driving efficiency in its operational setup.

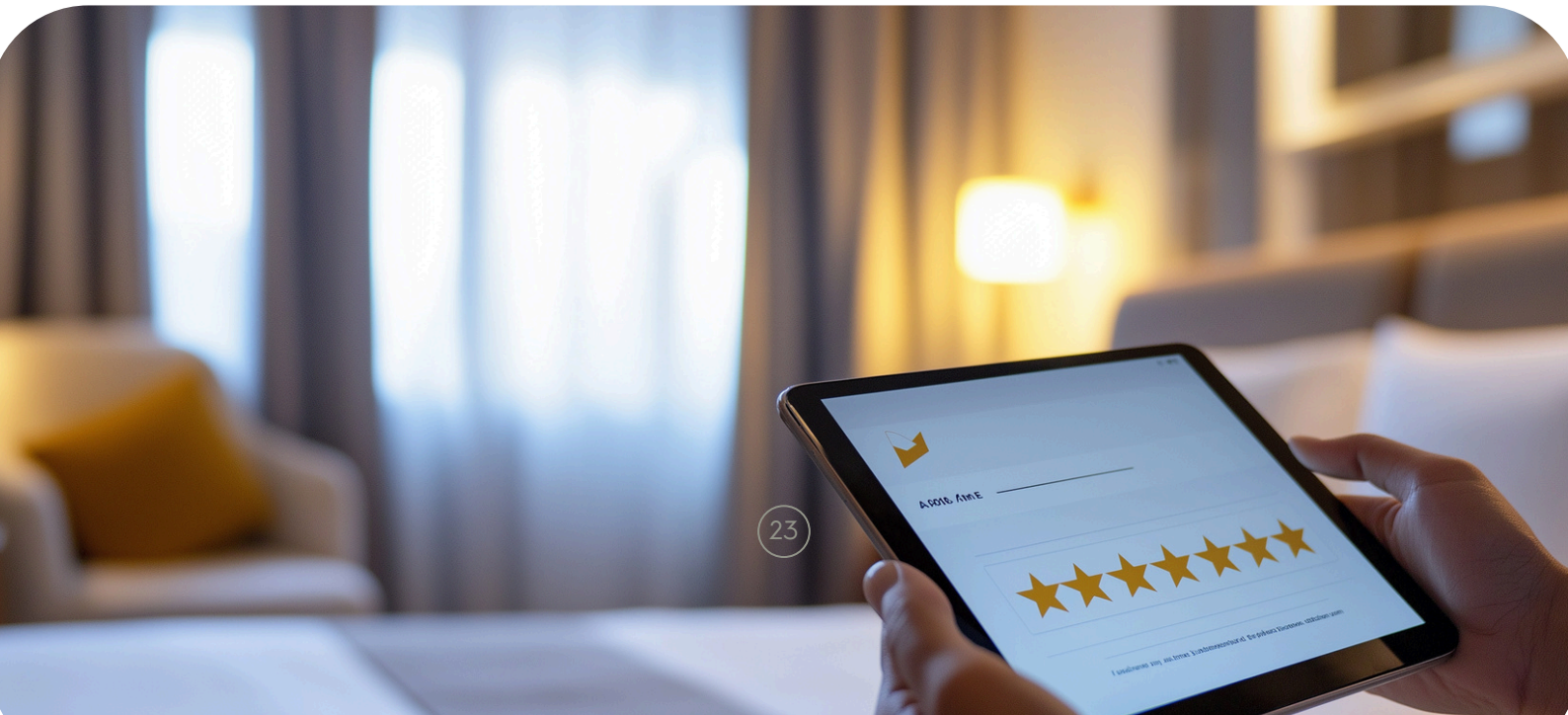
While certainly guest experiences are some of the trailblazing areas of AI adoption, much of the operational efficiency gains and sustainability ambitions are starting to be materialized in the back of house, defined as the operational business side, usually not visible to the customer. The most central area of digital optimization lies in the resource allocation that ranges from staff scheduling to energy management, overall reducing costs as well as environmental impact. Particularly the field of predictive analytics allows for the anticipation of demand, enabling better inventory and revenue management. Especially here the adoption of dynamic pricing has been identified as a central area of adoption of AI-based support in the strategic management of seasonality, high-versus low-demand periods and price sensitivity of different customer segments.

The Future of AI in Strategy & Innovation in the Hospitality Industry

In line with many other industries, the hospitality sector will also be undergoing a fundamental transformation. The opportunities AI opens are to be seen both in the front end as well as back end of hospitality operations, allowing innovations in the hospitality sector to drive efficiency and cost savings as much as enhanced guest experiences and bespoke offerings. As Prophet [45] points out, 54% of digital transformation efforts are and will be focused on modernizing customer touchpoints, while 45% will improve business infrastructure.

From a strategic standpoint, AI enables both radical and incremental innovation by detecting early trends and insights from vast data pools, already collected by hospitality organizations globally. While many of the incremental opportunities will lie in the understanding of current customer behavior, longitudinal analysis allows for emerging travel preferences or untapped market potential, which is hard to detect without AI support.

With all the advances on the horizon, two areas will require attention to ensure a successful adoption of more AI-based operations: the human-digital interface and the balance between digital and human touchpoints. When alluding to the human-digital interface, challenges caused by a delayed adoption of digital infrastructures as well as widespread digital illiteracy are central to be addressed. As hospitality organizations increasingly blend digital and physical domains, having a workforce skilled in both technical and human-centered approaches is essential for sustainable innovation and competitive advantage. Simultaneously, the value of each touchpoint with the customer will require a deeper understanding of its ability and need for digitalization. While AI enhances efficiency and personalization, the emotional connection that defines hospitality must remain intact.



Finance

AI in Finance

AI has significantly transformed the financial sector by enhancing operational efficiency, increasing accuracy, and enabling more objective decision-making. One of the most profound applications is algorithmic trading, where AI algorithms process vast amounts of market data to identify patterns and execute trades at a speed and frequency that human traders cannot match [46]. These systems are designed to exploit market inefficiencies, thereby optimizing trading strategies and returns [46]. In portfolio management, the development of robo-advisors has made sophisticated investment strategies more widely accessible [47].

Dr. Jean-Philippe Weisskopf
Associate Professor

Using AI algorithms, these advisors offer automated, personalized financial planning services tailored to individual risk preferences and financial goals [47]. This innovation has also made professional investment management more accessible to a wider audience, enabling a greater number of people to participate in financial markets.
Beyond trading, AI is used extensively in risk management, financial forecasting and market analysis [48]. Financial institutions leverage machine learning models to enhance the accuracy of risk prediction and creditworthiness assessment. These models analyze multiple data sources, including real-time information (nowcasting), to identify early warning signals of financial distress or market volatility [48]. This facilitates enhanced risk management and contributes to improved financial stability within organizations and across the broader market.

Finally, the impact of AI extends to customer service in the financial sector through the use of chatbots and virtual assistants [48]. These AI-powered tools provide round-the-clock customer support, handle routine queries and offer personalized financial advice. This improves customer experience but also reduces operational costs, allowing financial institutions to allocate resources more efficiently [48].

Application of AI in Finance in the Hospitality Industry

By analyzing diverse data such as booking patterns, market demand and seasonal trends, AI algorithms can automatically adjust room rates in real-time. This enhances occupancy and revenue, which reduces default risk and higher returns through more predictable revenue streams [49].

In the area of fraud detection and financial security, AI systems monitor transaction data to identify anomalies that may indicate fraudulent activity [50]. Machine learning models can now detect new types of fraud more quickly and flag them to better protect hospitality businesses and customers from financial loss. This continuous and fast adaptation is important in an environment where fraud techniques are constantly changing and becoming increasingly sophisticated [50].

AI also improves the management of financial operations by automating routine tasks such as invoice processing, payroll management, and expense tracking [51]. Automation minimizes human error and speeds up financial reporting, allowing hospitality companies to maintain more accurate records and comply with increasing regulatory standards more efficiently. This not only minimizes errors but also helps to run efficient operations in times when it is difficult to hire skilled labor [51].
In the area of real estate investment analysis, AI supports hospitality companies by evaluating potential investment opportunities [51]. Through sophisticated data analysis, AI models assess the financial viability of property acquisitions or renovations, helping stakeholders make more informed decisions [51].

The Future of AI in Finance in the Hospitality Industry

The future of AI in hospitality financial management will bring greater efficiency, accuracy and strategic responsiveness. As AI technology advances, its integration into financial operations will become increasingly pervasive and sophisticated, transforming the way organizations manage their finances.

A major trend is the wider adoption of AI-driven predictive analytics. Future AI systems will not only forecast revenues and expenses with greater accuracy, but also predict market trends, customer behavior, expectations and desires, and potential risks.

Another expected development is the evolution of AI in dynamic pricing. Future models will refine their ability to adjust prices in real time, taking into account a wider range of variables such as customer sentiment, competitor behavior and macroeconomic indicators. This will enable highly tailored pricing strategies that maximize revenue.

AI will also play an increasing role in improving internal audit and compliance. Through deeper integration of all internal data sources and processes, AI systems will continuously monitor financial transactions and flag any anomalies or irregularities, ensuring that hospitality companies comply with increasingly complex and extensive regulatory standards and internal policies. This continuous oversight will improve governance and reduce the risk of financial mismanagement.

Insights From Hotel Industry Professionals

Lastly, we asked some hoteliers friends what they think about AI in their daily activities...here is a set of answers that we collected.

> *"AI is streamlining hotel operations by automating repetitive tasks such as check-ins, room assignments, and customer service inquiries, which allows employees to focus more on guest interaction and problem-solving. For guests, AI enhances the experience through personalized recommendations, faster service via chatbots, and more tailored communication across digital platforms. This is extremely challenging for luxury hospitality as human interaction is expected and required every step of the way."*

> *"In the future, AI will likely take on more complex operational roles, giving employees more time to focus on high-touch service. Guests can expect a more seamless and anticipatory experience, where their preferences are predicted and met in real time, often before they even make a request. We are actively working on these."*

> *"The key challenges include ensuring data privacy, integrating AI with PMS and other systems, managing the fear of job displacement among staff, and preserving the human touch that defines luxury hospitality. We can prepare ourselves by investing in ongoing staff training, choosing ethical and transparent AI solutions, and ensuring technology is not used to simply replace human service. Building flexible systems that integrate seamlessly with existing platforms and maintaining a strong focus on personalized, human-centered hospitality will be essential."*

Miguel Plantier
General Manager and COO
Sublime Comporta

“To ensure successful adoption, AI needs to integrate seamlessly with the guest experience and enhance rather than replace human interaction where it is desired. In terms of AI challenges now and in the future, it is important to ensure that the information being served is unbiased and that users continue to think for themselves.”

Claudia Beaufort
Chief Commercial Officer
Zermatt Hospitality Group

“One potential challenge associated with AI is too much trust without critical thinking. Hoteliers need to assess AI's implementation carefully.”

David Frei,
General Manager
Grace La Margna St. Moritz

Our Reflection

As hypothesized, generative AI adoption is fast and comprehensive. Hoteliers use ChatGPT, but some also explore other generative AIs. Their behavior confirms our belief that generative AI is fast and the market is an oligopoly. Hotel experts use generative AI in different ways, ranging from searching for information, writing marketing messages, enhancing images, learning about AI adoptions, controlling KPIs, and speeding up task execution. Hotel industry experts are generally optimistic about generative AI's potential contribution to improving their productivity and delivering fast, efficient results.

Our hypotheses about AI-embedded hospitality technology are confirmed as well. Compared to the high adoption rate of generative AI, dominated by ChatGPT, hotel experts have quite different usage behaviors for AI-embedded hospitality technology. Given the chronic talent shortage, hoteliers use AI-embedded systems to recruit and screen applicants, streamline operations and avoid overtime. Hoteliers also use AI-embedded systems to manage housekeepers, manage reviews, and create reports, aiming for efficiency and time-saving. Generally speaking, the adoption rate is much slower.

We also confirmed that hoteliers use an indirect approach to implement AI in their businesses. To reap AI benefits, hoteliers use various AI-embedded hospitality technologies. These AI-embedded hospitality technologies were already utilized in the business before generative AI became known. These firms have accumulated years of data and experience and have incorporated AI and machine learning in their products. We are convinced that the incorporation of AI and machine learning in business operations will help the hospitality industry benefit from AI.

While we believe these established technology firms have the expertise needed, we also realize that AI is a black box. How do we evaluate the performance of different AI-embedded technologies? How do we assess the accuracy of AI output? Since most hotels will buy only one AI-embedded technology in one domain, hoteliers will not be able to determine AI performance easily. We believe the industry association and academia should work together to answer these questions.

Most of the existing AI-embedded technologies have added AI to their products, instead of starting from scratch or building a new product based on AI. No doubt that adding AI to legacy systems is the most efficient way to incorporate AI, and these players have data and experience. Yet, we wonder if there will be AI-native hospitality technologies, meaning an AI-first company deciding to tackle hospitality vertically. Only time will tell.

We noticed that hoteliers who are more comfortable with technology are using AI-embedded technologies for various purposes. These hoteliers were able to identify several AI-embedded technologies in several domains (such as marketing, revenue management, operations, etc.). Alternatively, some hoteliers just started their AI journey and are focusing on one or two areas with one specific technology. This phenomenon may imply a growing gap between first movers and the rest. The former probably have more financial and human resources, and the mindset to take risks. These advantages will help first movers to experiment, learn, and reap the benefits of AI before their competitors.

Final Conclusion

We believe AI is not a fad and is here to stay. Although there are more unknowns than knowns, we remain optimistic about the future of AI.

To help hospitality ventures capture the benefits of AI-embedded technology, we urge hotelier associations, academia, and technology firms to work together to develop trustworthy use cases. Academics are experts in transferring knowledge and skills. Hotelier associations have the credibility to spread the message. With these use cases, hoteliers can assess the feasibility of implementing these technologies.

We encourage hoteliers to use our list (Figure 5: An Inventory of AI-Embedded Hospitality Technology) to reflect on the adoption of their AI-embedded technology. We remind hoteliers to remain human-centric while avoiding technology-centric gimmicks. In other words, technology needs to serve humans, not the other way around. Hoteliers should identify pain points that AI-embedded technologies could address, then identify solutions best serving this purpose. Too often, people pick technologies first without considering the users. Consequently, technologies can't serve the purpose. We also encourage hoteliers to share and learn from each other.

Our final recommendation is addressed to hospitality technology providers. We believe that, in the future, AI will not replace humans, but technologies with AI will replace technologies without AI. We also caution existing technology firms that native AI firms from adjacent industries may be their biggest threat in the near future.

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