Techno-business strategies for enhancing guest experience in luxury hotels: a managerial perspective

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Abstract

Purpose – This research aims at understanding techno-based strategies deployed by the hospitality industry by exploring the emerging technological product and process innovations that are actively being used in the hospitality space to deliver enhanced guest experiences. It also aims at gaining perspective about the challenges of technology adoption faced by the Indian luxury hotels that have traditionally been driven by high-touch, unscripted and personalised service.

Design/methodology/approach – This paper adopted a two-pronged methodology for data collection – in-depth semi-structured interviews with General Managers of Luxury Hotels in India and literature-based innovation output (LBIO). NVivo12 software was used to carry out a qualitative thematic analysis of the data. The primary data collected was then triangulated with secondary data gathered through literature review of academic papers, industry reports and studies on the use of technology for enhancing and co-creating customer experience in luxury hotels.

Findings – The research brings in to focus the importance of technology and high-tech, state-of-the-art tools in facilitating the co-creation and delivery of experiences in the context of luxury hospitality. However, it also emphasises that the high-touch dimension is the core of hospitality in luxury and premium hotels and should remain the primary driver of this segment. Luxury hotels will have to fine-tune and tailor their services and provide the right mix of high-tech and high-touch, depending on the micro-niche segments to which they cater.

Practical implications – Practitioners, researchers and educationists in the hospitality industry would find the implications of this study useful in context of the evolving technology imperative and the present customer-centric business environment where hotels are constantly striving to meet the exponentially rising bar of guest expectations.

Originality/value – This study is the one of the few empirical explorations of the techno-based strategies adopted by luxury hotels for co-creating enhanced and high-value experiences leading to critical implications for both hospitality and tourism theory and practice.

Keywords Technology, Hospitality, High-tech, Luxury hotels, Guest experience, High-touch

Paper type Research paper

Introduction and context

In the hospitality industry, and specifically with the luxury segment, a notable transformation is taking place – there is a gradual shifting of the core focus from a physical asset or product-based model to one which hinges on customer-centric experiences that are personal and customisable (Knutson *et al.*, 2006). This shift has been driven by a fundamental change in the

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global perception of value on the economic front. "Economists have typically lumped experiences in with services, but experiences are a distinct economic offering, as different from services as services are from goods" (Pine and Gilmore, 1998, p. 97).

Advances in communication, transportation and information technology have led to the emergence of the e-savvy, global traveller with an increasing need for hedonistic, unique, customised experiences and who demands fulfilment of these expectations for the premium paid. Today's travellers progressively seek culturally immersive, highly customised and innovative experiences (Scott *et al.*, 2009; Miao, 2011) where the level of experiential delivery is consistent across providers and platforms. The emerging experience economy has led to a competition-infused scenario where hospitality providers need to constantly innovate and create customised experiences to address the unique personal tastes and requirements of a guest (Bharwani and Mathews, 2016).

According to Porter (1980, 1985), to develop and sustain competitive advantage, business organisations must pursue either cost leadership or differentiation. For luxury hospitality, cost leadership, from an input cost perspective, facilitates greater profitability and hence may allow for more efficacious luxury pricing than a competitor, all the while protecting the bottom line. Hospitality organisations that adopt the strategy of differentiation are innovation-oriented and endeavour to offer new or unique products and services for which their customers are usually willing to pay a premium price (Bharwani, 2014). The twin goals of cost leadership and effective differentiation can be simultaneously achieved by using technological innovations in products, services and experiences. Thus, techno-based strategic management both enables and challenges managers to analyse and evaluate how technological resources can be put to optimum use and how they may be best integrated with a firm's resources and capability structures towards the development of sustainable competitive advantage (Fahy and Smithee, 1999).

According to the Oslo Manual, "A technological product innovation is the implementation/commercialisation of a product with improved performance characteristics such as to deliver objectively new or improved services to the consumer. A technological process innovation is the implementation/adoption of new or significantly improved production or delivery methods. It may involve changes in equipment, human resources, working methods or a combination of these." (OECD/Eurostat, 2005, p. 9).

In the context of the hospitality industry, investments in technology can be a source of competitive advantage through value-added product and process innovations which lead to reduced costs, greater agility in speed of delivery and superior guest service (Bilgihan *et al.*, 2011). Technology is also increasingly becoming the crucial fulcrum which allows a guest to instantaneously and dynamically stitch together his or her own unique canvas of desired experiences from the palette on offer.

Neuhofer *et al.* (2014) posit that technology undeniably plays a critical role in the enhancement of customer experiences in the context of the tourism industry. They have developed the experience typology hierarchy that puts forth four overarching levels of experiences in terms of the increasing role technology plays in the co-creation of consumer experiences. There is overwhelming evidence to support the fact that experiences in the hospitality world are changing on two fundamental fronts – consumers are now a critical element in the process of "co-creation" of their experiences; and the increasing role that technology now plays in actually "mediating" the experience (Neuhofer *et al.*, 2014). The contemporary hospitality guest mindsets and preferences are continually and exponentially evolving to include authenticity, bespoke experiences, seamless and frictionless interactions and on-demand functionality, and technology plays a critical role as an enabler in curating and delivering guest experiences (Deloitte, 2017).

The global proliferation of the internet, ubiquitous use of mobile technologies and the immersive character of social media has led to an increasing realisation that an explosion in the scale and intensity of technology-driven interactions now characterise the relationship between individuals and hospitality organisations in the sphere of value creation. Other key emerging verticals of the technology drive in hospitality which warrant consideration are – Recognition Technology and Wearable Technology for access control and in-house offer customisation, Robotics for service delivery, Chatbots for basic query-handling to free staff resources, the effective use of the Internet of Things (IoT) to customise a guest experience and economise on costs, using artificial intelligence (AI)-driven Big Data mining for better customisation of offers and curated experiences, Virtual Reality (VR) to offer a customer more effective buying knowledge through an immersive sales experience, use of Augmented Reality (AR) to intuitively layer the stay experience in a more personalised style and Blockchain technology for streamlining guest loyalty programs and hotel distribution strategies (Cognizant, 2017; Deloitte, 2017; Oracle Hospitality, 2017).

The rapid pace of technological innovation and proliferation has presented hospitality organisations with the conundrum of choice. Since the commitment to a new technology in terms of both purchase and integration costs are often significant, it is imperative that hospitality organisations carefully evaluate its guest comfort level with the adoption of certain type of technology and also how a particular technology will drive value in terms of guest experience enhancement, reduced costs and increased operational efficiency .

Hence, along with the new technological innovations that impact guest experience in the hospitality industry, this paper also discusses the various facets of the Guest Experience Trajectory that a hospitality company could consider when evaluating the efficacy of new technology. This is often critical in differentiating between a technology selected for its pure novelty value and a technology that has potential to enhance the hospitality company's market differentiation or guest loyalty attractiveness on a sustainable basis.

Objective of the study

In context of the evolving technology, imperative and the present customer-centric business environment hotels are constantly striving to meet the exponentially rising bar of guest expectations. This research aims at gathering insight about the various broad verticals in which technology can interface with, and be woven into, the fabric of dynamically customisable guest experiences. It looks at exploring the delicate balance between the inevitable adoption of high technology (and its possible reduction of interpersonal interactions) and the inveterate need for high-touch customised service experience which are the hallmarks of luxury hospitality. This study is an empirical exploration of the techno-based strategic product and process innovations adopted by luxury hotels in India for co-creating enhanced and high-value experiences leading to critical implications for both hospitality and tourism theory and practice. It also aims at gaining perspective about the challenges of technology adoption faced by the Indian luxury hotels which have traditionally been driven by high-touch, unscripted and personalised service.

Research methodology

This paper adopts a two-pronged methodology for data collection – in-depth semi-structured interviews with seven General Managers of Luxury Hotels in India and literature-based innovation output (LBIO). The initial intention was to primarily conduct an exploratory study to collect primary data from the general managers through qualitative, semi-structured, personal, in-depth interviews to capture their views on the technological innovations adopted by luxury hotels for enhancing and co-creating guest experiences. A consequent corollary was

also to gather an understanding of any existing or anticipated barriers to the aforementioned technological innovations being introduced.

According to the Oslo Manual (OECD/EuroStat, 2005), data on technology-based product or process innovations can be collected using two main approaches: the subject approach and the object approach. The subject approach is an input-based approach with explores the various activities (for e.g. R&D), their costs and factors that influence innovation output by directly collecting data from the management of a company using surveys or interviews. The object approach takes a prismatically opposite perspective, collecting qualitative and quantitative data about specific innovation outputs of a firm based on the opinion of experts or new product announcements in trade journals or through press releases (OECD/Eurostat, 2005).

The subject approach entails gathering data about product and process-based technological innovation in a company by directly collecting data from its managers using surveys or interviews. While it gives first-hand insight into the characteristics of the innovation, the business motivations behind the introduction of innovations and their beneficial impact on the company, this methodology is fraught with its own challenges. Review of literature shows that researchers adopting this methodology, which relies on company representatives for data, may come across "secrecy and non-response biases; issues related to construct validity and self-reporting" (Kander *et al.*, 2019).

The in-depth interviews conducted with the luxury hotel managers in the course of the research caused the authors to pause as it was evident that, while the respondents all accepted the indisputable impact technology would have on guest experiences going forward, their responses were fettered by some pertinent constraints. Firstly, the universe of reference was limited to the respondents' personal experience. Further, this inadequacy was also ringfenced by the breadth and intensity of the respondent's organization's level of adoption of technology. Research shows that Indian hospitality organisations lag behind in technology adoption in contrast to their western counterparts (Sharma, 2016). Therefore, another constricting factor in the experiential narratives of the general managers was the fact that their canvas of corroboration was largely in the Indian context.

A robust method to overcome some of the above-mentioned challenges is the LBIO methodology. According to Coombs *et al.* (1996), LBIO methodology originated in the US (Edwards and Gordon, 1984) and later in The Netherlands (Kleinknecht, 1991). Here, researchers gather data about innovations from the "new product announcement" sections and editorials of technical and trade journals of an industry. These articles detailing the latest innovations are not paid advertisements by the company. LBIO assumes that the editor objectively selects important industry innovations in an unbiased manner for inclusion in the journal and hence an "LBIO sample tends to capture notable industry developments" (Kander *et al.*, 2019).

The focus of LBIO in terms of the unit of observation is the innovation output rather than the innovating firm which may often be the case while gathering data through surveys or interviews. "Moreover, the LBIO indicator captures actual innovation output rather than input to the process, e.g. R&D" (Zach *et al.*, 2018). Coombs *et al.* (1996) highlight the benefits of LBIO as: currency of information (along with the longitudinal data, the news of the latest innovations is also captured), objectivity (data is collected from a reliable, neutral source), and comprehensiveness (as innovation data is gathered about a wider range of small and larger firms from the across the industry).

However, some researchers have argued that the data generated from LBIO may be skewed towards innovation output from smaller firms which are reported in journal editorials as larger firms may use their own channels to communicate their innovations (Acs and Audretsch, 1990; Santarelli and Piergiovanni, 1996). Kander *et al.* (2019) also

caution for controlling bias in the selections of the journals by cross-checking the innovation by "the reading of two or multiple journals". Meanwhile, Zach *et al.* (2018), in their hospitality industry focused study, have extended the data sources used for LBIO to include press releases by companies, announcing new innovations, as a useful data harvesting methodology for identifying hospitality innovations. They contend that press releases help overcome editor selection bias and any important innovation information that may have been overlooked by the trade publications (Zach *et al.*, 2018). Thus, this research paper has used an amalgam of methodologies to triangulate the data from in-depth interviews and secondary research data with LBIO data.

Literature-based innovation output data set

A combination of two online hospitality technology journals (hospitalitytech.com and hoteltechnologynews.com) and innovation-related press releases of four major global hospitality firms (Marriott, Accor, IHG and Hyatt) was deployed for gathering the LBIO dataset (Appendix) to address and overcome the bias in selection of journal, as well as the editor selection bias, discussed in the methodology section.

At the outset the researchers identified pertinent keywords to ensure judicious selection of articles related technological product and process innovations which had an impact on guest experience in the hospitality context (Zach *et al.*, 2018). The primary keywords included: "innovation", "novelty", "new product", "new process", "new technology", "smart technology", "high-tech", "digital", "guest experience", "guest journey". This list of keywords was further augmented based on the review of literature (Cognizant, 2017; Deloitte, 2017; Oracle Hospitality, 2017) to include some emerging technologies impacting and shaping guest experience in the hospitality industry, adding "artificial intelligence", "recognition technology", "chatbots", "robotics", "wearable technology", "virtual reality", "big data", "internet-of-things", "blockchain" as additional keywords.

The aim was to identify adoption and development of as many completely new technology product and process innovations as well as incremental innovations which had an impact on guest experience in the global hospitality industry context. A manual check was conducted to eliminate articles which matched keywords but were not relevant for the study or innovations which did not impact guest experience directly. NVivo12 software was used to carry out a qualitative thematic analysis (Boyatzis, 1998) of the LBIO data. The "articles" from the online hospitality technology sites and press releases of four global hospitality chains were used as unit of analysis. The coding unit used throughout the coding phase was "sentences". A theory-driven coding scheme was deployed, and emerging technologies identified through literature review were used as coding themes. The qualitative data was thus analysed using deductive pattern-seeking as a methodology for scientific reasoning to identify the various broad technology verticals by that were actively being used by hospitality organisations to curate and orchestrate superior guest experiences.

Guest Experience Trajectory

Hospitality customers are looking for high quality, innovative yet consistent guest experiences especially in the context of luxury hotels. With diminishing differentiation in hospitality products and services there is a need for unique value-added innovations which are more personalised and experience focused (Bharwani and Mathews, 2016).

The Guest Experience Trajectory in the hotel industry has three distinct stages – pre-stay, in-stay and post-stay stages (Radde, 2017). Each of these stages offers several touch points or moments of truth which independently and synchronously influence guest

experience. The pre-stay stage for the guest encompasses inspiration, search, booking and may also include paying for the hospitality stay and experience. This is the stage where expectations are formed. During the in-stay stage, the guest interacts with the hospitality environment and the actual customer service delivery happens and experiences are staged. Finally, in the post-stay stage the guest evaluates the overall experience, forges memories, forms opinions and may/or may not give feedback about whether or not the expectations, set in the pre-stay stage, were met or not (Knutson *et al.*, 2010). Technology is increasingly playing an instrumental role in "mediating" the guest experience at each of these touch points (Neuhofer *et al.*, 2014).At each of these three stages, the hospitality organisations need to carefully curate the guest experience and decide on the symphonic roles humans and technology would play in orchestrating the experience.

Drawing from the interviews with the general managers and from the review of literature, the researchers posit that the guest experience architecture is based on five key building blocks – exploring guest needs, engaging guests, empowering them to co-create their experiences, exciting them with wow moments and empathising by listening to guest feedback. As the guest transitions through the three aforementioned stages of the Guest Experience Trajectory, technology can be harnessed to play a pivotal role in actualising each of these five foundational dimensions to create a highly personalised and differentiated experience for every guest as discussed below:

- *Exploring* – Exploring, learning and collecting information about guest needs and preferences are the cornerstones of delivering superlative guest experience. The luxury hospitality industry thrives on use of technology for mining data to create personalized profiles for each guest based on stay history and individual preferences (Peterson, 2011). Predictive analytics, based on the unique insights from the data gathered, can then be used for generating marketing leads and curating a hyper-personalized marketing mix to target the right customer, with the right message for the customized service offerings through appropriate channels. At a more macro-level, technology can be used for understanding emerging trends in the hospitality industry as a whole and tailoring service innovations to match customer demand to create superlative guest experience.
- *Engaging* – While technology plays an important role in guest acquisition and retention in the pre-stay and post-stay stages, with the increasingly digitally savvy customer, the role of guest services technology in engaging with guests during their hotel stay cannot be over-emphasized. The main focus is to use technology to ensure that the in-stay hotel and room experience is efficiently seamless and frictionless throughout. Smart IOT-based room technology, self-service technology, virtual concierges, mobile-based technology and robotics are being increasingly used to enhance guest engagement during their stay and improve guest comfort and satisfaction (Cognizant, 2017; Oracle Hospitality, 2017).
- *Empowering* – Technology has empowered hospitality guests to evolve from being passive consumers of experiences to being active co-creators of experiences. This has led to the emergence of a "prosumer society", reflecting the notion of consumers being actively involved in both the process of consumption and production (Prahalad and Ramaswamy, 2004; Ramaswamy and Gouillart, 2008; Ritzer and Jurgenson, 2010). Through the use of technology, hotel guests are playing an increasingly active role in co-creating and shaping their experiences along with the hotel hosts instead of simply consuming staged hospitality experiences (Neuhofer *et al.*, 2012).

- *Exciting* – The emerging experience economy has led to a competition-infused scenario where hospitality providers strive to constantly innovate and create customized experiences to address the unique personal tastes and requirements of a guest, exceed their expectations and delight them with unexpected wow moments (Torres and Kline, 2013; Bharwani and Mathews, 2016). According to Knutson *et al.* (2010), customer service during the in-stay stage is the most important part of the overall guest experience in the hospitality industry. Technology-supported customer service innovations can play a critical role in elevating the overall guest experience especially during the in-stay stage (Enz, 2011) and may even lead to an exceptional customer service incident that might completely override many other less than satisfactory variables of a guest's experience (Landahl, 2015).
- *Empathizing* – Technology can play a pivotal role in empathizing with guest feedback and listening to them. During the guest stay tracking guest journey with the help of technology and real-time data analytics can help hotels anticipate complaints and prevent service failures and implement expeditious service recovery. At the post-stay stage AI-based predictive analytics can be used to identify detractor guests with a high churn risk. Proactive action can be taken to address the guest issues to move guests back from detractor/neutral to promoter territory to ensure continued guest loyalty and retention.

Emerging technologies shaping guest experiences

In the context of the hospitality industry "technology is a critical catalyst in creating a differentiated experience" (Oracle Hospitality, 2017, p. 18). Hospitality organisations are weaving technology ecosystems as enablers into the fabric of dynamically customizable guest interactions to create frictionless, value-added, high-impact guest experiences. Based on the interviews and a qualitative thematic analysis of the LBIO data using NVivo12 software, the emerging technological product and process innovations that are actively being used in the hospitality space to deliver enhanced guest experiences can be categorized into five broad verticals based on the type of technology used. These are discussed in the following sections.

Wearable technology

Wearable technology refers to an application-enabled computing device that can be integrated into accessories or gadgets that could be worn "on the body (like a smart patch), around the body (like a wristwatch or a headband) or in the body (like an identification sensor embedded under the skin [. . .])" (Kurwa *et al.*, 2008, p. 2).

Wearable technology allows for seamless interface, communication and management of data (Çiçek, 2015) and can play an important role in enhancing the guest experience from the backend of operations as well as on the frontline. On the backend, urgent guests requests can be seamlessly and discreetly routed to the appropriate and proximately located service staff on their GPS smartwatch wearables, who can respond with a discreet tap, acknowledging to guest as well as to the rest of the service team that the request is being attended to. The employee can handle the request with agility, reducing response time and accelerating speed of service. It improves the communication efficiency with the guest as well as the within internal staff team ensuring real-time handling of requests and tasks. It can also generate rich task management data to allow for powerful analytics for more efficient management of operations through optimum allocation of human and material resources within the hotel.

On the frontline, the erstwhile Starwood Group created SPG Keyless powered by the SPG app which could be downloaded by their preferred guests on their wearables (smartwatches) or mobiles to enable them to have a smooth and seamless check-in and unlock their hotel rooms with a simple tap on their smart gadgets at the Aloft, Elements and W brands of the group.

Walt Disney World Resorts' Magic Band is a waterproof wristband that epitomises the power of wearables in creating a frictionless, interactive and memorable guest experience through the use of technology. The Magic Bands arrive by mail even before the guests embark on their magical adventure of a lifetime. If guests sign up for the "Magical Express" experience, the Magic Band replaces all the details and hassle of paperwork and becomes the ubiquitous master key for the entire duration of the trip. The guests' bags get tagged right at the home airport and will smoothly arrive to their rooms in the Orlando hotel. Travel and access to all the parks and rides, meals and other purchases throughout their stay are integrated and facilitated by simply swiping the Magic Bands. The sensors in the band allow the Disney employees to pinpoint the guest location and gather data points about the quality of the guest experience in the park. A negative event like an extremely long wait in the line can be immediately mitigated by emailing a free ice cream coupon or a pass to another ride thus recasting the experience into a positive memory. The "magic" of wearable technology can play an instrumental role in allowing hospitality employees to "move past transactions, into an interactive space, where they can personalize the experience" (Kuang, 2015).

Virtual reality and augmented reality

VR uses technology to immerse the audience into a computer-generated audio-visual digital environment. VR can be experienced through VR headsets that are connected to a computer (Oculus Rift) or a gaming console (PlayStation VR) or though standalone devices (Google Cardboard) using 360 video technology on a smartphone with a headset (The Guardian, 2016).

Several luxury hotel groups such as Marriott, IHG and Accor are increasingly using 360-degree 3D and VR presentations and virtual tours on their websites or other social media sites as an immersive sales and marketing tool to allow potential corporate and leisure guests to virtually explore and experience the various event facilities and room options available at their hotels without leaving the comfort of their respective offices or homes. It also helps synchronise and integrate all the marketing material of the group at a central hub and showcase the unique characteristics of each of their properties allowing for a quick comparison. To make a compelling sales pitch, several Accor Hotels in Europe including Fairmont Le Montreux Palace, Sofitel Munich Bayerpost, Raffles Europejski Warsaw use VR to conduct virtual show rounds of the hotels for prospective clients and even upsell to them by allowing them to virtually compare the different room categories by clearly demonstrating the difference.

IHG's "ViveZone" uses VR to offer gaming and entertainment in a fully immersive digital generated environment in its hotels in Beijing, Shanghai and Sanya in China. The hotel guests also have the flexibility to experience the Vive line of VR content through Viveport application in the comfort of their own rooms. Marriott Hotels launched VR Postcards, a series of immersive travel stories that guests could view on Samsung Gear VR headsets. The headsets can be ordered by the guests through "VRoom Service" which allows guests to enjoy these inspiring VR experiences within the comfort of their hotel rooms.

While VR substitutes the real-world environment with a virtual one, AR uses technology to enhance the real world environment in real time by superimposing digital components on

reality and alters the users' perception of their physical surrounding. Marriott International and Pepsi's premium bottled water brand LIFEWTR jointly offer LIFEWTR augmented reality experience in some of their hotels, where guests can browse through the virtual artwork curated by LIFEWTR (accessed by scanning a QR code on the bottle label with a mobile phone) and can then transform their hotel room walls with an AR art gallery of the LIFEWTR artists and post pictures on social media. This innovatively taps into areas such as social responsibility, encouragement for the arts, individual need for customised creativity and the ability to engage a wider audience on social media within the intimacy of a guest room setting.

Premier Inn's Hub Hotel in the UK uses AR to enhance guest experience through increased interactivity within the hotel rooms. Guest rooms have an interactive wall map of city and pointing a smartphone at the map will deploy AR, bringing alive the local places of interest on the map. Other hotels like Best Western Plus Kelowna, in Canada creatively use AR to engage and entertain their guests in an outdoors geocaching adventure which is a blend of scavenger and treasure hunt where the AR app on the smartphone turns a mundane poolside lawn into myriad niches of excitement taking the guest on a virtual and interactive wildlife adventure quest.

However, what seems to be a factor currently limiting the introduction of AR extensively in hotels is the complexity of the "wearables". Hence more hospitality companies are venturing into the VR space at the moment. As the integration of technology into the room space itself advances, customisation of room artwork, window views, aromas, sounds etc. are all key interface areas where AR and VR technology will allow both guests and hospitality companies to experience myriad customisable options.

Artificial intelligence

AI is the "development of computer systems able to perform tasks that normally require human intelligence such as visual perception, speech recognition, decision making, and translation between languages" (Oxford Dictionary, 2021). AI is playing an increasingly important role in enhancing and personalising guest experience in the hospitality industry.

Several global hotel chains including Marriott International, the Accor Group and the Radisson-owned Edwardian Hotels are using AI-powered chatbot messaging services through mobile apps to create a frictionless and transformed experience for their guests across all the three stages of the Guest Experience Trajectory from pre-stay through post-stay. The chatbots are programmed to use Natural Language Processing and Natural Language Generation in multiple languages to create an intelligent simulated conversation with humans. The Edwardian Hotels' chatbot Edward, Marriott Aloft's ChatBotlr and Caesars Palace's Ivy serve as 24/7 front-end customer care platforms for virtually interacting with guests, attending to their regular requests, answering their queries and offering hyper-personalised recommendations in multiple languages. These AI-driven automated guest engagement platforms free up frontline employees from routine tasks, thus allowing them to concentrate on delivering more personalised and enhanced hospitality experiences to their guests and also saves on labour costs.

Caesars Palace in Las Vegas is a pioneer in big data-driven analytics with its two decade old Total Reward loyalty program which has been capturing guest data from the moment they make their booking till they leave the hotel and uses AI to mine this data to deliver exemplary, tailor-made experiences to each of its guests. In 2018, IHG has also launched Concerto, its cloud based technology platform linking it to its IHG Rewards Club to use guest data effectively to improve stay experiences. AI-powered predictive data analytics can play crucial role "exploring" and understanding guest needs and preferences. Through AI

and the use of machine learning a hotel can collect track and analyse guest data to build unique 360 degree profiles for each guest, map their user journeys, and curate unique guest experiences. Based on the data amassed, sophisticated recommender systems can use AI to make hyper personalised recommendations and customise offers to compliment guest lifestyles, "exciting" guests and leading to guest delight.

In addition to chatbots and predictive data analytics, recognition technology and robotics using AI-powered in-person customer service have also remarkably transformed the guest experience. These AI-based technologies are being increasingly embraced by the hospitality industry and are discussed in further detail below.

Recognition technology

Recognition technology can be categorised into voice and face recognition technologies. Voice recognition technology (VRT) relies on AI to understand specific speech patterns as commands, and respond to those commands appropriately (TechTarget, 2021). Several hotel global chains including Accor Hotels with its world-renowned luxury brands such as Grand Mercure, Sofitel, Raffles, Fairmont, etc. and the Marriott Group at its Westin, St-Regis, Aloft and Autograph Collection brands, are currently using VRT to enhance guest experience. The hotels generally use either Google Home or Apple HomePod or Amazon Echo (integrated with virtual assistant technology Alexa for Hospitality) as smart-hubs to automate in-room controls (for TV, lighting, temperature, blinds). These VRT-enabled smart-hubs can also be deployed to enable seamless guest communication with in-room service for housekeeping and F&B needs, to access to a virtual concierge and even for guest check-out. This allows for shorter response times, intuitive connectivity and seamless service for superior guest experience. To further increase guest engagement through personalised interactions, VRT also allows guests to access their personal music and other digital content through applications linked to their existing accounts and also stream digital content by pairing their phones and other personal devices with the hotel room gadgets via Bluetooth.

Face recognition technology (FRT) is based on biometrics. It can be used to identify people by scanning their faces by mapping multiple facial features through thermal imaging and analysis of skin texture and comparison with a database (Fessler, 2018). Marriott rolled out a pilot for using face-recognition technology in two of its properties in China in mid-2018. A Marriott city hotel in Hangzhou which is a technological hub and a Marriott resort located in Sanya, one of the most popular leisure destinations in China, were chosen for launching the pilot program for using FRT for self-check-in. FRT can be very useful for security and access purposes not only during check-in but also within the different hotel areas which have access restricted only to in-house guest such as the lounge, pool, gym or spa, allowing seamless movement for bonafide guests. It is a very useful technology for exciting and creating "wow" moments for the guest by allowing employees to quickly identify guests and deliver a more personalized greeting and curate a tailored service offering.

As recognition technology is still relatively new, it has a novelty value and can be used by the hotels which have adopted it as distinguishing proposition to appeal to today's tech-savvy traveller and create a distinctive competitive advantage for themselves.

Robotics

From Mario at the Marriott, to Connie the robot concierge at Hilton, to Dash at the InterContinental, the hospitality industry is seeing a proliferation autonomous and semi-autonomous robots across hotel front-lines impacting guest experience.

What is a robot? A robot is computer-controlled machine capable of movement which have been programmed to carry out complex tasks automatically. Some robots (humanoids) may be designed to resemble humans and may make use of artificial intelligence and both voice and face recognition technologies to sense, think and act autonomously replacing human effort (Moravec, 2021).

Robots are being increasingly deployed to augment the level of customer service and thereby positively impacting guest experience in terms of speed and accuracy of service delivery and freeing up employees from mundane tasks. Marriott's humanoid robot Mario at their hotel in Ghent, Belgium welcomes hotel guests in different languages and hands them their key cards at the reception desk, recites menus and makes PowerPoint presentations at MICE functions and even entertains children in the hotel. Hilton's Connie, the concierge robot powered by IBM Watson and Way Blazer can respond to guest queries about local tourist attractions, proffer dining recommendations and also inform guests about the hotel's inhouse facilities and amenities. Dash, IHG's transportation robot is programmed to independently move at human walking pace, navigating its way to guest rooms across the Crowne Plaza hotel in Silicon Valley to ensure quick and seamless delivery of amenities on demand. A.L.O. Botlr is Aloft's version of the robotic bellhop providing efficient concierge service to its guests at its Cupertino hotel.

While using robots in the hospitality industry for customer facing services has the advantage of speed, precision and consistency with limited amount of down time leading to extended efficiency, several hotels are deploying robots more for their novelty value rather than from a strategic business perspective. This has engendered the "high touch v/s high tech" debate weighing the benefits of replacing human interaction with automated precision in employee-guest interface in hotels. In fact, one of the first hotels to introduce robots to replace its front desk employees in 2015, Henn-na in Nagasaki, Japan, has already has cut down its robotic workforce "after the experience failed to reduce costs or workload for its employees" (Hertzfeld, 2019; Shead, 2019).

The mapping of the actual use cases of the emerging technologies in the hospitality context discussed above, against the five building blocks of guest experience are depicted in Table 1.

It is evident that simpler and older technologies such as wearables map across all the five dimensions by virtue of having been around longer and because of ease of use, whereas newer and more complex technologies like Robotics are not yet mainstream but are primarily being deployed for engaging and exciting guests, providing novelty value at the current juncture, with their full potential yet to be exploited. The potential usefulness of other nascent technologies like Blockchain for loyalty programmes, data security and supply chain management is a hot topic of discussion in literature (Srivastava, 2018; Revfine, 2019). However, the researchers did not come across any actual use cases of this

Table 1. Mapping of emerging technologies for building guest experiences

	Wearable technology	Virtual and augmented reality	Artificial intelligence	Recognition technology	Robotics
Exploring	✓	×	✓	✓	×
Engaging	✓	✓	✓	✓	✓
Empowering	✓	✓	×	✓	×
Exciting	✓	✓	✓	✓	✓
Empathising	✓	×	×	×	×

potentially disruptive technology in the hospitality context, perhaps because of the gradual pace of adoption of due to nebulosity surrounding the Blockchain concepts.

Challenges in technology innovation adoption

Globally, technology is becoming an inherent and an invaluable ingredient in the guest experience recipe across hospitality organisations. In fact, in the Indian hospitality context too, technology was viewed as game changer and an enabler of superior guest service by the interviewees who were all General Managers of luxury hotels based in India. According to Respondent 3:

> "Over the past couple of years technology has had a profound impact on how we identify guest needs and provide a high level of personalised service".

However, all the respondents were unanimous in their view that Indian hotels were definitely in the late majority (Rogers, 2003) in adoption of technological innovations as compared to their global counterparts. They clearly elucidated the challenges in implementation of techno-based strategies in the context of luxury hotels in the Indian hospitality industry. According to Respondent 2:

> "Guest often expect latest technological innovations at hotels, but we need to step back and critically analyse the ROI from the investment [. . .] the technology may become obsolete before it is even depreciated".

The general consensus was that one of the key challenges in adoption of technology innovations in the Indian hospitality industry lay in the fact that the costs were disproportionate to the benefits that accrued from the innovation.

> "The business case for the most technological innovations is weak, especially in the absence of the ability to mitigate these expenses by charging a higher price to the guests." – Respondent 5.

Thus, the respondents were of the opinion that taking a cautious approach to new market technological innovations is prudent as it mitigates the risk of exposing the business to potential risk.

In the context of Indian luxury hotel segment, the human element has been the cornerstone of the exemplary levels of service. Guests at have become accustomed to highly personalised service and superlative guest experience based on abundant choice, customization and convenience emanating from the personal and emotional employee-guest connect. The employees are empowered to use their ingenuity, intuition and interpersonal skills to provide unscripted care to their guests to create unforgettable bespoke experiences and wow moments for their guests. High-touch service has been the key differentiator and a source of competitive advantage in an industry which lays high premium on exceeding guest expectations. In fact, Indian luxury hospitality industry has been thriving on the back of bespoke experiences (Nair, 2017).

So while all the respondents were in consonance about the important role technology can play in enhancing operational efficiency and creating a superlative guest experience, equally, Respondents 3 and 4 vehemently denied that high-tech innovations could replace authentic, high-touch service.

> "Several hotels abroad have introduced robots and AI-powered chatbots to showcase their high-tech inclinations. We see no value in introducing innovative technology for technology's sake – it cannot be just for gimmicks, it has to enhance guest experience."– Respondent 4.

Respondents 4, 5 and 7 were also unequivocal in cautioning against hotels making considerable investments in untested technology without clearly understanding the level of

tech-adoption readiness of their customer base and the speed of obsolescence of the innovation:

> "Hotels are adopting new tech innovations like self-check-in kiosk at the front office reception to up their tech quotient and appeal to the tech-savvy millennials. But what about the tech-handicapped baby boomers?" – Respondent 5.

Another debilitating factor in the adoption of new technologies stemmed from infrastructural limitations related to systems integration. Seamless integration of technology innovations such as smart room controls with the existing PMS could require digital or even physical infrastructure changes. In older hotels, especially those housed in heritage and listed building structures, retrofitting for technological innovations could pose quite a challenge.

Personalisation is the linchpin of guest engagement. AI and Big Data technologies are being increasingly deployed by hotels for gathering insights, personal details and consumer behaviour patterns of guests to customise and personalise memorable experiences. However, hotels have to carefully walk the tightrope balancing personalisation and privacy, taking a cautious approach excessive invasion of guest privacy:

> "While mining guest data plays a critical role in creating 'wow' experiences for guests, we have to be careful not to overstep the boundaries when it comes to accessing personal information for commercial purposes" – Respondent 2.

Stringent data privacy laws both globally and domestically are making hoteliers more wary while adopting technology for gathering and analysing the data gathered from various touch points along the Guest Experience Trajectory.

The main challenges to technology adoption in luxury hotels in India have been well-encapsulated by the interviewees. Primary is the fundamental centrality of the human warmth element in differentiating Indian hospitality from some of its Occidental counterparts. The profile of the luxury traveller in and to India – largely a CXO or senior management position for city business hotels and slightly older, affluent but less technologically comfortable travellers for the leisure properties – all of whom tend to equate high touch, personalised service as the key benefit that luxury hotels afford.

The aforementioned aspect of guest perception tends to diminish the perceived value addition that additional technological advances deliver. While seen as "nice" they are not deemed "necessary" and hence the vast majority of travellers are not willing to pay an additional premium for a more technologically enabled hotel experience.

Often, the mere transfer of the performance of a task from a human being to a robot or machine, while possibly cost effective in the long run for the hotel, is seen as gimmicky by the guest. The Henn-na hotel in Japan scaled back on its ubiquitous use of robots as these often failed to deliver the service sought consistently and seamlessly. Interestingly, the guest seemed less willing to forgive a service delivery failure by a robot than by a human – an intriguing case of differentiated efficiency expectations (Yu, 2020).

Finally, most interactive forms of technology that value add to an experience do so by the efficient and expansive back end use of big data to better offer a customised solution to a guest. While a human service provider might be lauded for such intimate guest information knowledge, any machine, offering the same or a greater level of customisation, comes with the attendant concerns about data privacy. Besides the challenges discussed above, the cost of the technology and the attendant expenses of integrating it with the existing product, all tend to constrict the speed and span of technology adoption in luxury hotels in India.

Managerial implications and conclusion

The essential conclusion of the forgoing discussion is that luxury hotels seem to be keen on using technology as an efficiency enhancer or support system to their frontline people. The immediately available, individual-specific, pertinent information that technology can provide a frontline staffer, helps immensely enhance the efficacy of the personalisation he/or she can offer a guest on a dynamic basis. Thus, luxury hospitality operators need to be careful to intuitively and intimately understand the essence of what their guests need from a customised experience – what ratios of novelty, empathy, discretion and value each guest desires from every interaction. This helps to identify the form of technology which will represent effective value to the guests.

Once the specific technology is identified, the cost of introduction (of purchasing the technology), the potential inconvenience of integration (of the technology with the existing product) and the possible scale of intrusion (that big data's mining of an individual's behaviour over multiple platforms) need to be calculated. With the net cost of introduction of the technology in place, a final evaluation of the increased revenue or meaningful market differentiation it can render, needs to be done to truly ascertain whether such a technological innovation/addition warrants business consideration. It is, thus, important that hospitality organisations think beyond simply which type of technology is the latest, cutting-edge innovation, on the "must-have" list, and understand what technologies consumers are willing to adopt to co-create experiences that will drive real value. Luxury hotels must first envision the customer experience they want to deliver. Then, they can explore the technology options best suited to support their goals. Hotels should avoid impulsively investing in latest technology simply because it seems innovative.

To conclude, the research brings in to focus the importance of technology and high-tech, state-of-the-art tools in facilitating the co-creation and delivery of experiences in the context of luxury hospitality. However, it also emphasises that the high-touch dimension is the core of hospitality in luxury and premium hotels and should remain the primary driver of this segment. Luxury hotels will have to fine-tune and tailor their services and provide the right mix of high-tech and high-touch depending on the micro-niche segments to which they cater.

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Appendix

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Table A1.
LBIO data set

(*continued*)

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41	https://newsroom.hyatt.com/news-releases?item=123878
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Table A1.

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