

An aerial view of a city skyline at sunset, with a network of white lines and dots overlaid on the image. The network consists of numerous nodes connected by thin lines, creating a complex web that spans across the cityscape. The background shows a dense urban environment with various skyscrapers and buildings, some of which are illuminated. The sky is a mix of orange and yellow, suggesting the time is either sunrise or sunset. The overall composition is modern and tech-oriented.

Artificial Intelligence

*A Game Changer in the
Hospitality Industry*



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01

FOREWORD

technology, but also how such use impacts every corner of the business model. It eventually requires strong and disciplined execution capabilities that ensure swift, efficient and successful delivery of the strategic plans and decisions made.

As this report shows, technology-led innovation levels are incredibly high at present and with the full limits of the use of big data yet to be explored, it suggests the hospitality industry is only at the start of this particular journey. Yet while enhanced guest experiences can lead to enhanced returns, the industry also needs to pay attention to the wider aspects of embedding technology into the business model.

Our survey on Hospitality and AI (page 14)* carried out in France, UK, Germany, US and China suggests there are some stark national differences on travelers' experiences and expectations relating to the use of AI. It's important, therefore, that the hospitality industry fully understands how leisure travelers feel about their AI experiences and how comfortable they are about giving up their data, which is a crucial element of AI and machine learning tools. Related to this is the security of data held, which is a further issue that the industry is currently grappling with. It is only by building high levels of trust in these areas that guest loyalty will be achieved. Operational transparency and a strong

process driven approach will be key elements of building the necessary levels of trust required.

More understanding is also needed on the impact of technology-led innovation to business processes themselves and the effect on human resources. Employee trust will be a key factor if the industry wants to maximise the use of technology within business processes. In this respect, exploring how technology can enhance rather than replace human expertise will be important going forward.

As technology pushes the boundaries of what can be achieved, hospitality businesses will need to adapt their models at a much quicker pace than previously needed. In what is a creative and inspirational era for the industry, having the confidence to apply technological innovation will increasingly come from a deep understanding of the issues, the practicalities of implementation and the expectations from guests that, as in any other area of the business might vary dramatically from one region to another.

The aim of this report is to shine a light on a range of interconnecting strategic issues that the hospitality industry now faces. We hope you enjoy it and look forward to your comments.

As we move into an era where disruptive technologies become accessible for everyone and widespread over all industries, some of these technologies are set to dramatically change how the hospitality industry operates in the future. We are already beginning to see the use of artificial intelligence (AI) and machine learning to carry out simple customer service tasks, as well as powering 'smart' hotel rooms that can adapt and predict individual guest requirements.

It's an exciting time to be in the hospitality industry where technology-led innovation is beginning to revolutionise the guest experience. While at

the same time, competition from new players is beginning to impact and reshape the sector. Going forward, how the industry reacts to such change is not only important to its future success, but also integral to the continued success of the wider travel and tourism sector that now accounts for 10.5% of global GDP (1).

It requires strategic vision and decision making that embraces technology as an integral, rather than a separate, driver of business growth and improvement. It also requires strong leadership and trusted partners that understand the issues that not only underpin the increased use of



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*Survey powered by **YouGov**

(1) World Travel Tourism Council: Travel & Tourism Economic Impact 2018 World <https://www.wttc.org/-/media/files/reports/economic-impact-research/regions-2018/world2018.pdf>



02

FROM ROOMS TO ROBOTS

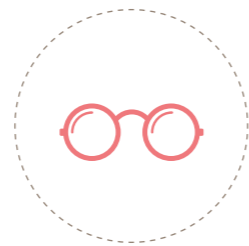
Artificial Intelligence (AI) is reshaping the hospitality industry as we know it. While hotels mainly staffed by robots may be some way down the line, hotels are using data and cutting edge technology to provide a range of innovative guest experiences.

Giving a great customer experience has always been at the core of the hospitality industry's offering. What has changed with the onset of technological innovation is how this great customer experience is delivered and by whom. Technology has not only given new tools to allow the industry to improve services to guests, it has also opened up the market to new intermediary platforms and aggregator sites that allow customers to bypass the host provider and shop around for their leisure needs, as well as the arrival of non-traditional challengers such as Airbnb.

However, as we enter a more advanced data-driven landscape, the use of smart technology and Artificial Intelligence (AI) is set to alter the shape of the hospitality industry even further. The use of powerful computer systems and algorithms that have the capability to mine and analyse huge amounts of data can not only help to provide more accurate insights into customer needs, but can be used to predict seasonal activity allowing for more accurate service provision, as well as educate machines to perform simple tasks.

The hotel industry in particular is proving to be fertile ground for such AI innovation. From smart rooms which are more tailored to guests needs, to AI-powered chatbots and robot concierges designed to provide guests with a more seamless check-in experience, real-time pricing or answer questions on local dining and sightseeing options which helps to free up human staff for more complex guest-related tasks and requirements.

Top traveller expectation



Virtual Reality

Consistently in the top AI expectations from European (German, French and UK), American (USA) and Chinese travelers

According to a survey undertaken by YouGov on behalf of Mazars "Comparing Trends on the AI Experiences and Expectations of Travelers across Five Countries".



AI is defined as the development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.

Inspiring travelers is a further way the industry is leveraging AI technology in order to provide a mix of more appealing experiences. Persuasive VR imagery techniques that allow people to explore prospective hotel rooms and immerse themselves in destinations are far more compelling than static images. UK travel agency Thomas Cook's "Try Before You Fly" campaign that let people experience New York City through VR, boosted excursions to New York by 190% and generated a 40% return on investment according to Bloomberg (2), proving that such innovation is not simply a 'good to have' product, but can improve the financial bottom line.

AI-powered measurement tools can also monitor customer feedback in real time so companies can intervene quickly and effectively to improve services. In terms of implementation, what hotel groups currently have to their advantage is their sheer scale and a global infrastructure that holds an enormous amount of customer data which can be used to detect and predict individual guest

(2) <https://www.bloomberg.com/news/articles/2015-06-19/how-oculus-and-cardboard-are-going-to-rock-the-travel-industry>

Most memorable hotel experiences



Hotel location
British and American



Comfort
French and German



Quality of food
French and German



Rapidity and convenience
Chinese

Source: Survey undertaken by YouGov on behalf of Mazars

Drilling down into guest needs based on nationality as well as age will be further factors that the

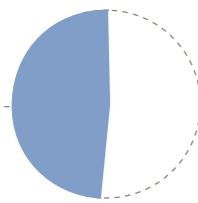
preferences to offer a more tailored customer experience.

Increasing dependency on smart phones and digital technology also provides deep reservoirs of customer data that hotels can study and assess to gauge specific interests and needs of prospective customers which hotels can then leverage to drive revenue.

When asked about memorable hospitality experiences, our survey found that British and Americans focused on the hotel location (25% and 23% respectively) while French and Germans particularly remember comfort (16% and 15%) and the quality of food (15% and 16%). Whereas Chinese travelers tend to focus more on the rapidity and convenience of the experienced services (23%). When considering all guest experiences, the second most memorable experience for all respondents is related to the use of apps, website, and mobile phone for booking services.

hospitality sector should explore when looking to apply technology in new and innovative ways.

As hospitality groups increase budgets towards technology, having key performance indicators (KPIs) in place will help highlight which digital projects to focus upon. For example, our survey tells us that only 48% of Western leisure travelers in France, UK, Germany and the US remember a

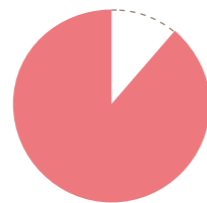


48%
Of Western leisure travelers (France, UK, Germany, US) remember a memorable experience involving digital innovation

Source: Survey undertaken by YouGov on behalf of Mazars

However, the fact that only on average 33% of answers regarding memorable experiences were strictly related to digital innovation also suggests that the industry is missing a key marketing opportunity to highlight the benefits of AI and digital innovation sufficiently to guests.

memorable experience involving digital innovation, which suggests digital innovation in the hospitality space in its current form is either going unnoticed by guests or is not innovative enough. Chinese travelers are the exception with 87% having had an innovation-led memorable experience.



87%
Of Chinese leisure travelers remember a memorable experience involving digital innovation

What will differentiate the hospitality industry in future will be how successful organisations are at seamlessly embedding their chosen AI innovation at operational level so that it both enhances and complements the desired guest experience.



SEVEN AI-INSPIRED DIGITAL INNOVATIONS



1. Smart In-room Tech:

Allows guests to unlock room doors using smartphones; in-room tablets; smart check-in & check-out systems; wireless charging pads; smart drapes & lighting; smart TVs and virtual reality.



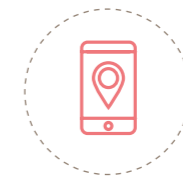
2. Self-Serve Tech:

Automated check-ins and check-out options using browser-based applications to mobile apps.



3. Robots:

From being deployed to check in guests and provide simple in-room service requirements to hotels mainly staffed by robots such as Tokyo's robot hotel.



4. iBeacons and Location-Based Tech:

Beacon and location-based technology allows information to be sent to customers when they are in specific locations. The technology can be used to send a virtual key to guests, allowing them to unlock their door through their phone, or to send maps and other information at opportune moments.



5. SIP-DECT Tech:

This is a powerful communication infrastructure that allows staff to stay constantly connected enabling them to do their jobs and interact with guests more effectively.



6. Social Listening:

Tools to pick up guest reviews as well as keep track of bloggers and influencers focusing on the hospitality industry in order to keep tabs on reputation and guest preferences.



7. Wearables:

The arrival of the Internet of Things (IoT) gives the ability to connect with each other via wearable devices more efficiently. Examples include Disney's MagicBand which guests can use in place of paper tickets to the park and key cards to their hotel room. Such innovation can be used to entice more guests to book directly, rather than through third parties.



03

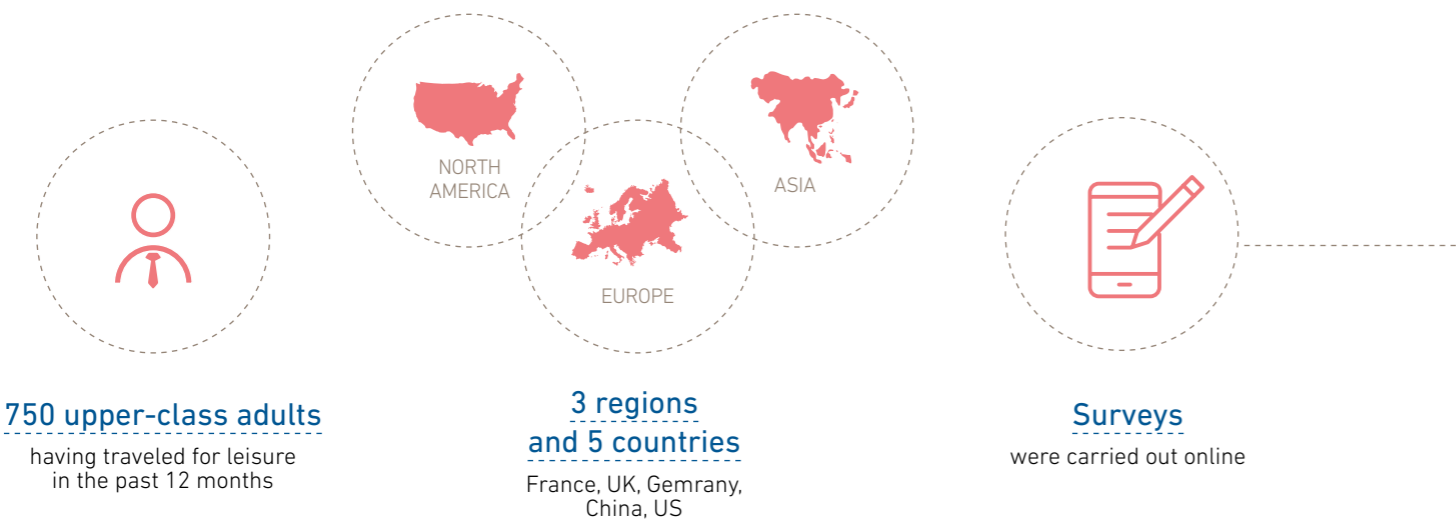
GIVING THE CUSTOMER
A MORE PERSONALISED
EXPERIENCE

With AI and smart technology giving the hospitality industry the tools to find out more about their customers' needs and provide a more personalised experience, this section of the report includes a survey conducted on behalf of Mazars, in partnership with YouGov, on what leisure travelers feel about the use of AI. We also look at the rise of the Chinese Free Independent Traveler (FIT), a hotel group's perspective, and similarities with both the luxury sector and the future of mobility.

What do leisure travellers think about AI?

As the hospitality industry explores the use of technology to streamline and improve the guest experience, a survey undertaken by YouGov on behalf of Mazars **comparing trends on the AI experiences and expectations of travelers across five countries** suggests that the hospitality industry needs to pay closer attention to the views of end users in order to truly capitalise on innovation employed.

The survey was compiled using a sample of 750 upper-class adults having traveled for leisure in the past 12 months. Surveys were carried out online, on YouGov panel and carried out in 5 countries: France, UK, Germany, China & US between the 14th – 18th of September 2018.



Survey powered by **YouGov**

Our survey focused on two key areas. First, to assess what memorable experiences involving an innovation in the hospitality sector travelers had experienced in the recent past in order to gauge

their perception of AI use, as well as particular preferences. Secondly, to evaluate what future innovations travelers would like to see as part of their hotel experience going forward.

Is innovation getting lost in the mix?

In terms of memorable experiences involving innovation, most Western travelers didn't remember any innovation-led experience suggesting that there is either a lack of innovation aimed at this particular market sector, or that AI use is having little impact on their experience overall. On the other hand, 87% of the more tech-enabled Chinese travelers could recall an experience involving innovation.

When asked to elaborate on their memorable experiences involving innovation, cultural differences showed through again. While the use of AI smart services featured quite low as a memorable experience across all countries - the highest percentage being 5% from US and Chinese travelers mobile apps are consistently in the top three of the most innovative experiences, whereas Chinese travelers in particular emphasize the rapidity and convenience of the experienced services (23%).

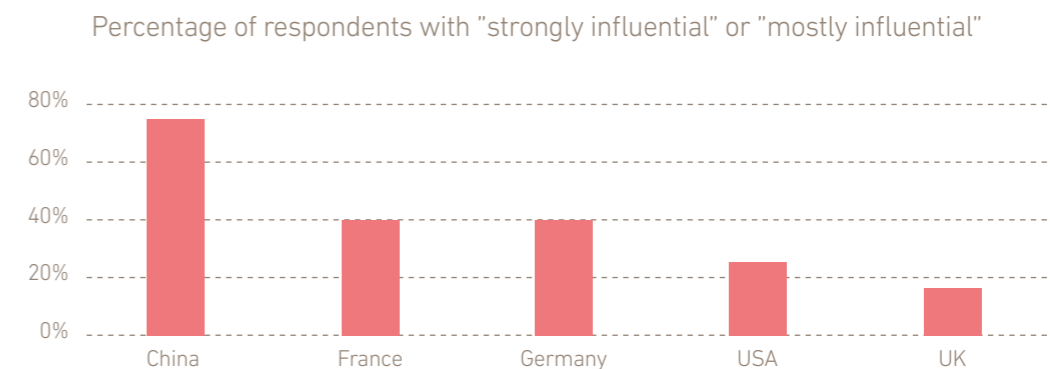
However, it appears travelers do not view innovation in the same light, with an average of 32% all respondents describing a memorable experience that was not strictly related to innovation.

Clear differences based on nationality

What is particularly interesting about the results is the clear differences the survey highlights based on the nationality of the respondent, the most marked of which were between Chinese and Western travelers. Chinese upper-class leisure travelers are very receptive to AI, according to the survey. Indeed, when it comes to hotel choice, offering AI services could positively influence the majority of Chinese travelers (75%). Whereas only 41% of French and German interviewed would be influenced by AI services when it comes to hotel choice, and even less so Americans (25%) and the British (16%).



To what extent would the presence of artificial intelligence services be influential in the choice of your hotel?



Source: Survey undertaken by YouGov on behalf of Mazars



Which feature would you prefer to find in your future hotel experience?

Top features travelers would like to find:



"Customised recommendations for nearby activities" ranks #1 for France, UK, Germany, and US



"Use of virtual reality to experience a virtual tour of hotel" ranks #2 for all countries



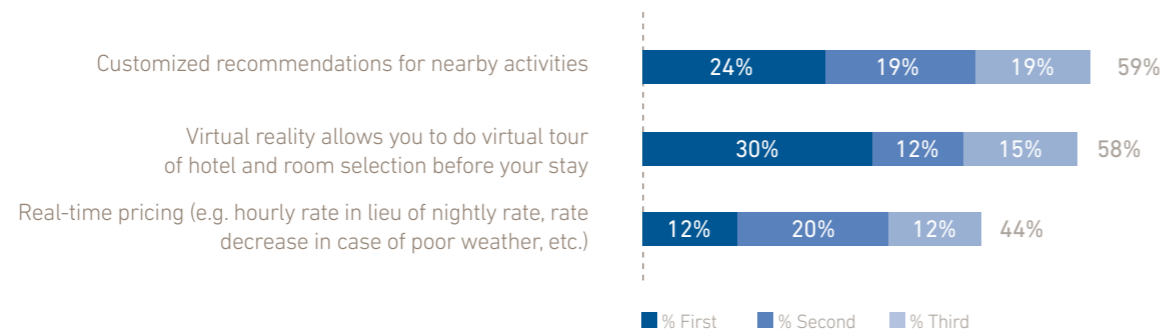
"Real-time pricing" is consistently ranked in the top 5 across all countries

By digging deeper into individual country preferences a more specific picture emerges. Room features controlled by a smart device was the top preference for Chinese travelers, whereas this preference was not a top three requirement for all other countries, with the exception of the UK. Travelers in France, Germany and the US were most receptive to the use of AI to deliver real time pricing benefits. Also, despite the current trend for

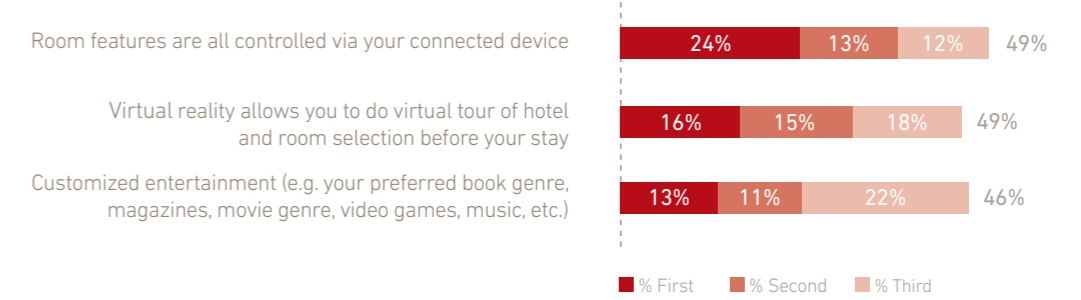
hotels to explore the use of AI-enabled robots or the application of big data to create social interactions, travelers do not currently count these as key preferences for AI services. It could be argued that the experimental nature of such innovations makes it difficult for travelers to currently envisage their full potential, or simply due to not yet having experienced their use.

Source: Survey undertaken by YouGov on behalf of Mazars

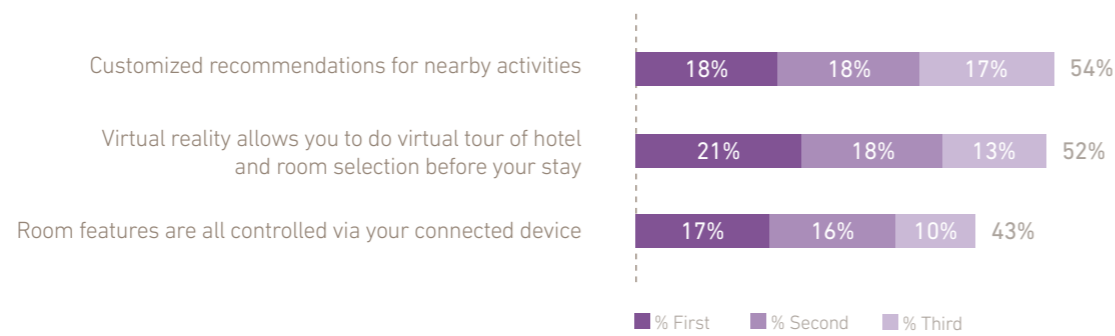
Preferences in terms of AI services – France



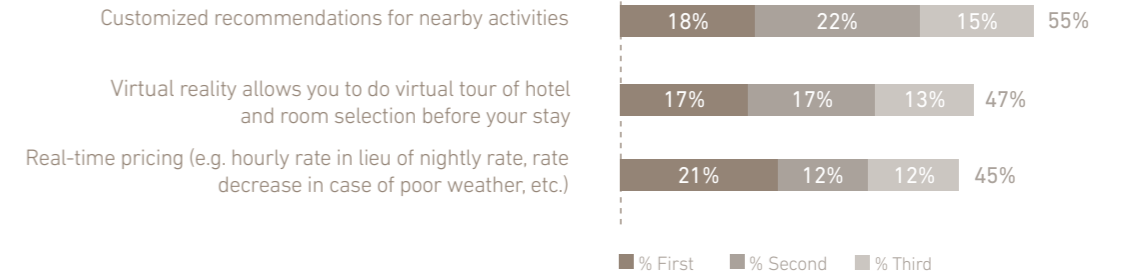
Preferences in terms of AI services – China



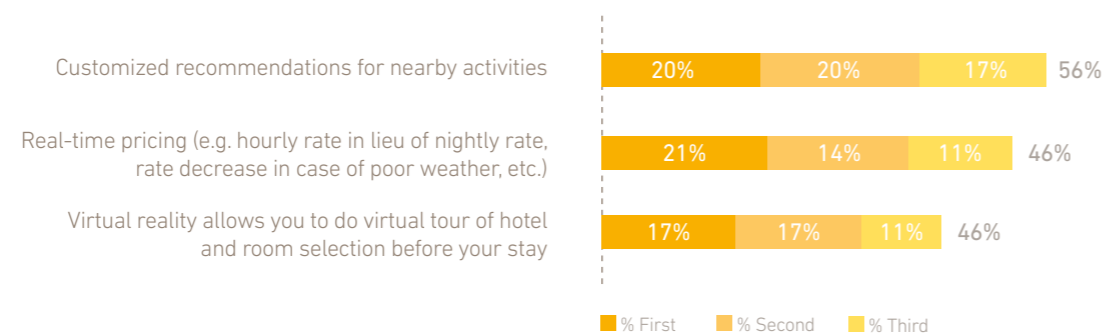
Preferences in terms of AI services – UK



Preferences in terms of AI services – US



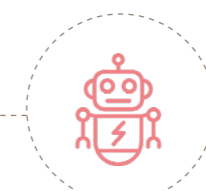
Preferences in terms of AI services – Germany



In all countries, applications facilitating social interactions in the hotel and robot room service were consistently ranked last.



Social Interaction



Robots

What this means for the AI Pipeline

It's clear from the survey outcomes that developing AI to improve services and the guest experience is not just a question of applying cutting edge technology, it's also about listening, reacting and predicting customer needs and preferences more methodically. Knowing the economic and social characteristics of the target audience and then boiling that information down further using national, cultural and age factors will help to create an AI approach that is more customised along economic, cultural and regional lines.

Key to this process will be knowing how much information target audiences are prepared to hand over. Our survey suggests that in order to have access to AI services, more than half of respondents in all countries would be willing to share their food preferences (UK and US 60%, Germany, China and France score > 50%) and their travel preferences with the hotel and its partners (UK 65% and Germany, China, US > 50%). Whereas Chinese upper-class leisure travelers are definitely more favourable to sharing private information such as their hobbies, geolocation during travels, job description, social media profile, access to personal mobile application, as well as access to personal photo gallery.



To access AI features in your hotel, what type of information would you be willing to share with the hotel and its partners?

In response to this question, it was interesting to note that almost all Chinese travelers (97%) were willing to share at least one piece of personal information proposed versus only a little over 80% of Western travelers.

Travelers willing to share at least one piece of personal information:



97%
Of Chinese Travelers



80%
Of Western Travelers

There is consensus from all 5 nationalities surveyed on the type of information they would be most willing to share with hotels:



Food preference



Travel preference



Personal information



Movies or music preference



Hobbies



Transport preferences

People from China are the readiest to share information that France, Germany, UK and US considered as private and confidential.

Percentage of travelers ready to share personal data:



Social Media Profile



Personal Mobile Application



Personal Photo Gallery

China	24%	19%	11%
Europe & North America (France, UK, Germany, USA)	9%	8%	5%







Source: Survey undertaken by YouGov on behalf of Mazars

Creating memorable experiences for travelers will increasingly depend on the hospitality industry's ability to understand travellers' AI needs in order to respond in a way that not only makes guests feel comfortable, but also enhances trust and loyalty.



TOP INFLUENCERS WITHIN THE DIGITAL SPACE IN THE HOTEL SECTOR

Digital innovation will play a key role in how the hospitality industry will look in the future. In recognition of its importance, many groups are employing dedicated and specific personnel to spearhead digital initiatives. We've named six people whose role we think potentially makes them the most powerful influencers within the digital space (3) in the hotel sector today.

 MAUD BAILLY Chief Digital Officer, AccorHotels	 NOELLE EDER Executive Vice President, Chief information and Digital Officer, Hilton Hotels	 ANDY KAUFFMAN Vice President of Digital Marketing, Marriott International
 SUE LUCAS Senior Vice President, Digital Innovation and eCommerce, Wyndham Hotels	 LAURA MILLER Chief Information Officer, InterContinental Hotels Group	 JULIA VANDER PLOEG Senior Vice President and Global Head of Digital, Hyatt Hotels

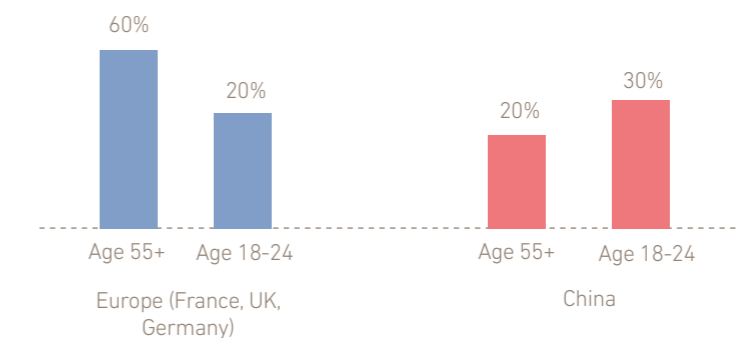
PROVIDING AN END-TO-END GUEST EXPERIENCE

As non-traditional providers continue to disrupt the hospitality industry, it's no longer enough to expect guests to find you. Using AI and smart technology to reach out to customers before, during and after each trip is now vital.

A key change the latest technology has brought to the hospitality industry is the ability to interact and engage with guests at a greater number of points along the trip planning journey. Providing such an end-to-end experience is also an important part of fostering a more direct relationship with customers as non-traditional intermediaries and challengers step into the hospitality space. One of the newer innovations that has emerged recently is the use of virtual reality (VR). VR provides a real-world environment rather than replacing it by allowing prospective guests the experience of visualising the hotel, exploring individual rooms, and searching for nearby attractions in an immersing and interactive manner. In terms of the preferred AI technology travelers would

like to see, the ability to experience a pre-stay virtual tour of the hotel and room selection using VR is a top guest preference, according to our survey. Indeed, it is the only preferred service in our survey that is classified in the top 3 of all the five surveyed countries (France, UK, Germany, US and China), suggesting there is global demand for VR technology. In particular it is favoured by older people in Europe: 64% of people aged 55+ in Europe against 20% of people aged 18-24. Whereas the reverse is true for China, where VR is favoured by younger travelers (30% of people aged 18-24 against 17% of people aged 55+), which suggests both cultural and purchasing power differences need to be factored in.

Percentage of travelers who would like to experience a pre-stay virtual tour of the hotel and room using VR



Source: Survey undertaken by YouGov on behalf of Mazars

In addition, by using VR to add graphics or useful information to an environment viewed through a compatible device, guests can, for example, point their smartphone at a building or landmark and learn more about it in real-time, or point at a restaurant and see the menu.

For hotels in particular, VR gives the ability to offer guests 24/7 access to information on an interactive basis to enhance the physical locations they are actually trying to encourage customers to visit or experience.

(3) as of 10.9.18

Such innovation is part of an ongoing programme that recognises that a physical presence is no longer enough. Creating additional value is now key to drawing the attention of guests and establish loyalty. For example, setting up branded communities is another way hotels are using AI-powered smart technologies to improve social connections with fellow residents that are customized to their preference. For example, a network for business travellers, kid-friendly groups for parents, dating for single travelers or providing a forum where guests can swap location and dining tips. This approach can not only show a high level of commitment to guests, but also a clear understanding of their travel needs. For the hotel, such an approach can also significantly increase the amount of exposure it receives through interactions within the community itself as well as on other platforms, including social media. Equally important, it's a further way to gather data that can help refine and improve guest services. However, such an approach needs careful management as current guest expectations and needs differ. While our survey shows there is not a big consumer demand at present generally for smart technology that facilitates social and business interaction, age and nationality have to be factored in. In Europe, young people are more interested in technology- led social interaction than older generations.

AI-savvy hospitality groups are already recognising the benefits of using smart technology to draw attention and create loyalty. Examples include Hilton's Connected Room initiative that aims to deliver the control, connectivity and personalization guests increasingly want when they're on the road. Connected Room gives a high degree of room personalisation and control by allowing guests to set preferred temperature, control lighting or continue watching shows or movies they were streaming before they arrived.

AccorHotel's Smart Room concept is also highly personalised and aims to meet the needs of every individual, including guests with reduced mobility. Doors fitted with an assisted opening and closing

system, an olfactory alarm clock, a system to help you get to sleep as well as a touchscreen tablet that controls all of the room's functions. AccorHotels also launched its virtual assistant, Phil Welcome, via Google Home's voice-controlled smart speaker which was a first for the hotel sector.

#1 feature in China



Room features controlled by connected device

As our survey shows, room features controlled by a connected device is the number one technology choice for Chinese travelers, although less popular with travelers from Western countries.

Source: Survey undertaken by YouGov on behalf of Mazars

As hotels map out their visions for the future, the use of AI and smart technology will become increasingly important to not only reflect what guests are looking for, but also remain one step ahead of their needs.



THE RISE OF CHINESE FREE INDEPENDENT TRAVELERS (FITS)



21%

Spending from Chinese tourists abroad now makes up 21% of all tourism revenue and continues to grow, according to the United Nations World Tourism Organization (UNWTO).



6%

Each Chinese traveller spends on average more per trip than tourists from any other country. And with only 6% of Chinese citizens currently owning a passport, the market is set for huge expansion in the future.

Due to its sheer size and spending potential, the impact of Chinese tourists on the hospitality industry cannot be ignored. However, attracting this sector of the market on a consistent basis requires going beyond sheer numbers and using data to delve into the habits and preferences of this lucrative market.

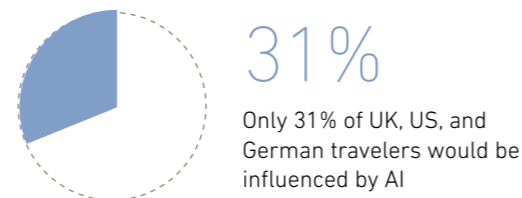
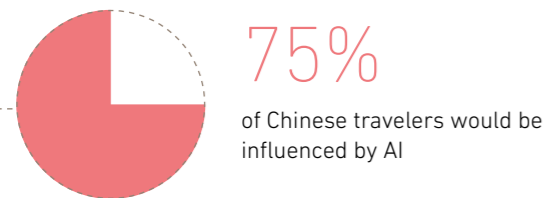
According to UNWTO data, there will be 219 million Chinese Baby Boomers aged 65+ by 2030, whereas 414 million Millennials currently make up 31% of the population. Although older Chinese consumers still prefer to travel to long-haul destinations on package tours mainly due to language barriers, the younger generation are opting to travel as Free Independent Travelers (FITs) using online and mobile device technology as their travel planner, destination guide, and payment method. It is this particular segment of the market that provides the biggest potential for utilising AI and smart technology to collect valuable personal data provided on reservation or location-based technology used once the client is in the hotel or resort. According to our survey, Chinese travelers

are indeed looking for comfort and convenience more than other countries surveyed.

Armed with this data, AI algorithms can determine the clients' habits, either to lure them back by offering a tailor-made experience, or to sell them additional products.

As well as a way to collect data and monitor services, the industry is increasingly using technology to, for example, customise hotel rooms to individual taste, providing virtual reality (VR) headsets as brochures and providing a smoother check-in experience through self-service booths and face recognition - services which are important to attracting the tech-savvy Chinese traveler.

According to our survey, AI services could positively influence 75% of Chinese people interviewed, whereas only 31% of the UK, German and US travelers' choices would be influenced by AI services, indicating a clear difference between Chinese and Western travelers.



Source: Survey undertaken by YouGov on behalf of Mazars

In particular, social media platforms such as WeChat are also seen as important channels to attract the Chinese outbound traveler who use WeChat as their first port of call when planning their travel needs and sharing experiences. Hotels are beginning to see the benefits of engagement through a range of initiatives from building WeChat account loyalty programmes that allow visitors

to search hotel facilities, nearby attractions or building more substantial partnerships that allow visitors to control their hotel room via WeChat. Partnering with online booking sites popular with Chinese tourists is another way hotels are using technology to engage with potential Chinese travelers.

A further technological development that the hospitality sector is exploring is the Chinese digital payment economy. Hotel companies are catching on to this trend by partnering with Chinese digital wallet companies to capture a greater share of the growing Chinese outbound travel market. The trend is an important one, particularly as a 2018 survey by Hotels.com and Ipsos found that the most important aspect of a hotel for Chinese travelers is that it accepts UnionPay or Alipay, above Chinese-language related services and cultural amenities.

Technology can also be used to tap into FITs growing appetite for holistic, experiential vacations. With social media the dominant tool

by which Chinese travelers express their travel opinions and interact with fellow travelers and family, it's a further way for the industry to promote "off the beaten path" attractions, local life and cultural events which are more popular with Chinese travelers than beach-based holidays.

This preference is highlighted by our survey which shows that while using AI to create customised recommendations for nearby activities ranks first for French, UK, German and US travelers, it is ranked last by Chinese travelers who prefer a more individually tailored approach.

Using AI to create customised recommendations for nearby activities



Source: Survey undertaken by YouGov on behalf of Mazars

The ability to apply technological innovation alongside a deep understanding of cultural differences and the high service standards that

the Chinese market expects will be key for the hospitality industry going forward.

A HOTEL GROUP'S PERSPECTIVE



Daniel Kos,
*Chief Financial Officer
of PPHE Hotel Group,
outlines how the group
uses technology and AI
to improve the guest
experience.*

Please tell us a little about PPHE Hotel Group

PPHE Hotel Group is an international hospitality real estate group with a £1.6 billion portfolio. The majority of our assets have been built and/or redeveloped by us and operated by our teams, as opposed to the traditional approach of separating these areas. We strongly believe that this integrated approach brings more value to our assets and operations. To drive value from our assets we excel at our operations. The core aspects are our employees performing exceptionally well in operations, delivering the best products and service to our customers.

From a real estate owner point of view, a while ago the experience of staying in a hotel was more of a luxury whereas nowadays it has become a commodity. Hence, we focus on the differentiating factor to fulfill the personalized needs of our customer.

The hospitality industry has witnessed remarkable change with the onset of technological innovation. As a hotel operator, how is this improving the guest experience generally and what particular changes can you see going forward?

The hotel industry is entering a golden age of personalization in response to evolving consumer expectations. Individual guests have embraced their own uniqueness. Many facets of the hotel industry have shifted to adapt to new technologies and changing consumer behavior, which have in turn changed how hoteliers conduct business and engage with customers.

At PPHE, our primary interest is our clients' satisfaction. Where we see the industry going is that service automation can incorporate everything from automatic check-in, selection of your room per your preference, to automatically proposing guests with amenities and services based on their previous selection process, such as extra towels or booking spa appointments. Different CRM platforms further enable us to provide a smooth customer journey.

There's a lot of focus on the use of technology and big data to improve the guest experience, but there's also an opportunity to use it from an operational and commercial viewpoint to improve marketing, monitor use of resources, and engage with local communities. What are your views on this and how does this fit into PPHE's future plans?

It is extremely important for hotels to invest in technology to enhance the customer experience. For example, the role of robotics is increasing in the hospitality industry, appearing in support offices for hotels around the world. Such initiatives and automated processes can help staff to be more present for guests by reducing several time-consuming and repetitive administrative tasks. Think of chatbots, online reservations, book keeping etc.

Artificial Intelligence (AI) is very important today. Focusing on the hotel industry, AI plays a huge part in both customer journey and in back-office operations. We use AI for revenue management to optimize our pricing strategy. With big data collected from customers, AI can analyse and

propose adapted pricing options. In coming years, AI will have the ability to provide even more customised information that hotels will be able to leverage. That being said, despite improvement in AI, there is no doubt that human expertise will continue to be imperative and pertinent. In addition, with the proliferation of social media, image sharing and online peer recommendations, many travellers today read online reviews before making a decision.

We have seen a number of non-traditional challengers come into the hospitality sector offering innovative state-of-the-art global distribution platforms, online travel websites for example. Do you see these as a threat or

do they complement PPHE's initiatives?

Our relationship with online operators is strong and healthy and is constantly evolving. Whilst hoteliers often raise discussion about commission levels, we understand the high levels of resources our OTA partners invest in accessing new business, which has a mutually beneficial result. OTA's help us daily to market our products around the world, and providing we operate in partnership, with a healthy and balanced approach, we recognise their importance for our business and our customers.



HOW IS THE LUXURY SECTOR GETTING SMART?



Isabelle Massa, Global Head of Luxury Services at Mazars and **Simon Beillevaire**, partner specialized in Luxury Services at Mazars, look at how the luxury sector is getting smart about technology.

The importance of AI in the luxury sector is growing significantly. The two main approaches to AI we are seeing are, first, on increasing the potential of the product by optimising production or the supply chain in case of strong demand. Secondly, to focus on leveraging the data collected and using it at precisely the right moment to offer highly personalised services. Additionally, AI applications exist that help detect whether a product is counterfeit or authentic.

While luxury brands pride themselves on having a more personal connection with customers, the use of AI is beginning to become more widespread. Take online luxury retail platform, Farfetch which connects creators, curators and consumers via a global technology platform specifically for luxury fashion. Its investment last year in Fashion Concierge allows Farfetch Private Client consumers to access exclusive merchandise and to source products from non-Farfetch sellers via their stylists. Working with big name luxury brands such as Gucci, the company is also working on its vision of the 'store of the future' using technology

that allows customers to, for example, flag a wish list of items via their phones when they stroll into a store, or even tell assistants that they are not feeling chatty. There's also examples of the wider use of Virtual Reality (VR) which realises the potential of linked data and devices. So, for example, when a customer has limited time to try on the clothes they wish to buy, they can use a smart mirror that mimics the body's silhouette. Through VR, the smart mirror can suggest different options and choices of clothing. This becomes a very effective personalised customer experience resulting in engaging the customer with the brand.

Of course, it's also important that AI technology does not distract from the personal service the traditional luxury sector prides itself on. Alongside creativity and innovation, traditions and continuity are some of the luxury sector's most important values. Going forward, AI's biggest potential is to complement such know-how and expertise. Our survey backs this up with the majority of guests unwilling as yet to replace human interaction, with less than 8% of respondents putting robots above humans as their preferred point of contact.

However, there is certainly room for the right type of AI technology use. For example, facial and eye recognition technology is being adopted by the Luxury Retail Industry to create a more customised shopping experience in-store. Eye recognition technology can analyse a customer's behaviour within the first few seconds of looking at a product to define whether they like it or not. The retailer can then analyse the results in order to improve and offer a more custom-built approach. It's an approach that has parallels with the hospitality sector where customer expectations are growing and personalisation and service level requirements are equally high.

Looking ahead, AI certainly has a role to play in helping the luxury sector provide a highly personalised product or service to customers. Importantly, AI gives the ability to leverage data collection and analysis in order to enhance the more traditional luxury service standards that customers continue to expect.



Mobility and travel are transforming greatly with new technologies and artificial intelligence. SNCF, France's national state-owned railway company, explain how digital transformation is a key tool to reach their vision of responsible mobility in the future.

THE FUTURE OF MOBILITY



Hervé Richard, Director of the “Mobility as a Service” (MaaS) programme and **Jade Valliès**, director of the “NFC” programme at SNCF (4) speak about their vision of mobility in the near future.

Could you please introduce yourselves and tell us more about your roles?

I am Hervé Richard, director of the “Mobility as a Service” (MaaS) programme, part of SNCF’s e-travel entity. More specifically, I focus on distances from 0-100 km. MaaS describes a shift away from personally-owned modes of transportation and towards mobility solutions that are consumed as a service.

I am Jade Valliès, director of the “NFC” programme, part of MaaS at SNCF. Our tool will help build the first bricks of MaaS, allowing travellers to store their purchased tickets on their mobile phones’ SIM cards, thus allowing them to enjoy a seamless journey and use their phone as a ticket even when it is turned off.

What are the main challenges that mobility is facing today?

One big challenge facing mobility is the need for sustainability. That means a few things. Firstly, environmental sustainability and limiting carbon footprint, as in the world, 30% of carbon emissions are due to mobility. There is also social sustainability, e.g. sustainable worker contracts and wages. Essentially, we are moving towards more responsible mobility. We believe a big revolution is around usage and “mobility as a service”, one of the most sustainable and feasible ways of transforming the transportation industry. Ultimately, we need to be able to provide commuters and travellers with mobility that is greener, more sustainable in the long-term, and convince them to use such means by making it easier than the more traditional method, which is the individual car.

Are technology and digitalisation facilitating this shift?

Technology and digitalisation are core to SNCF and allow us to optimise and simplify travel for our customers, whether they may be metropolitan, regional, or rural. We conducted a study a few years ago that showed that over half of French people would use more public transportation if they had a door-to-door pass. Today, NFC is a technology that will make that possible, and we hope that through technology and digitalisation, including AI, we will make travel simpler. However, technology alone will not work, and it’s important to first be equipped with deep knowledge of the industry and transportation ecosystem in order to best use technology, and to deploy it sustainably on a large scale.

How is technology and AI increasing the customer experience in mobility?

Depending on the type of travel, there are three very different meanings and expectations

of “customer experience”. Firstly, regarding day-to-day commuters, customer experience rhymes with simplicity. Here, technology and AI is all about optimising the daily commute and rendering it stress-free. Secondly, on longer-haul travels, there is room to provide customers with comfort and personalisation to enhance their experience. Technology and AI have a role to play here that is closer to what you can see in hotels, e.g. providing customers with a personalised welcome message, customised entertainment, travel recommendations, and all things that can make the experience more pleasurable. Finally, there are more remote travellers in smaller towns, who are simply looking to get to their destination. Here, travel can be optimised through artificial intelligence, predictability, giving back information, and contextualisation.

How can new technology be deployed on a large scale?

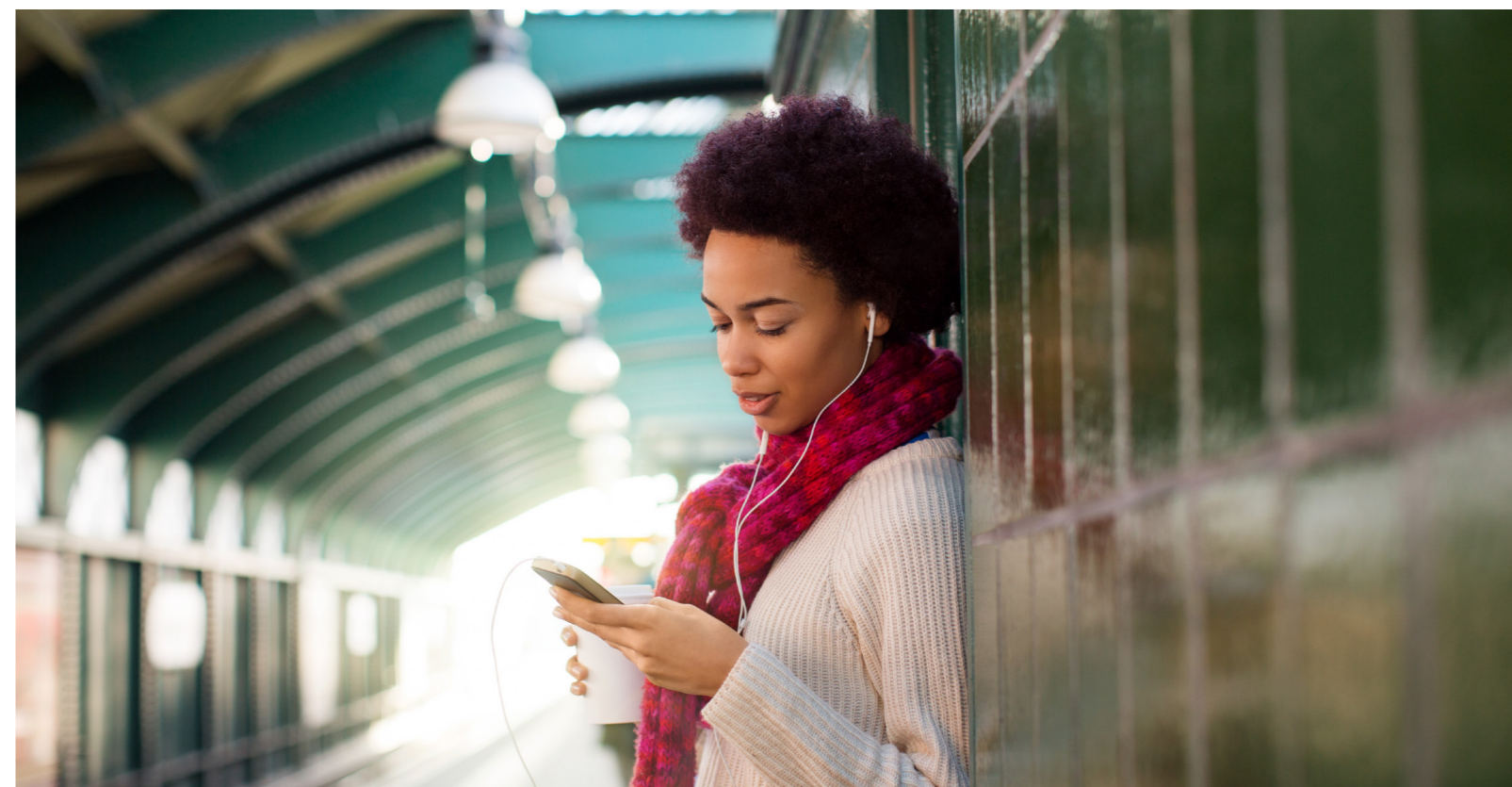
SNCF is just one piece of the transportation pie. In order to be able to implement a sustainably,

technology-driven shift, we need to work together with the entire ecosystem, including large agglomerations, infrastructure, regulators, and other service providers. At SNCF, we choose to help others optimise their operations by sharing some of our knowledge. Regarding the NFC initiative, for example, we created a hub together with 4 other players between transportation operators, cities, regions, and service providers, and put into place a SAAS platform that operators can integrate into their distribution systems.

How is SNCF competing with large players such as Googles and Apples?

A first step to competing with larger players is to hop on-board the digitalisation train. If you miss that, you will inevitably miss a piece of the pie. Next, you need to find synergies and work together with other local players, or else all will face disintermediation. Finally, we need to embrace our deep local knowledge of our traveller and offer personalised experiences that larger players may not be able to replicate.

(4) SNCF, “French National Railway Company” is France’s national state-owned railway company. It operates the country’s national rail traffic.





04

IMPLEMENTING AN AI-INFLUENCED BUSINESS STRATEGY

With AI technology being increasingly explored, how does it fit into the business strategy? This section of the report looks at the different AI strategies the hospitality industry is currently adopting.

INSIGHTS BEYOND PREDICTION



Marc Atallah,
co-founder of Zettafox
talks about how Artificial
Intelligence insights can help
the hospitality industry and
what tools are currently
being used.

What is Zettafox's involvement in AI (5)?

Zettafox is a computer science company that can help leverage data for companies through Artificial Intelligence (AI) and to supervise machine learning. We can also complement and enhance existing prediction and scoring models. We focus more on the "call to action", giving decision makers access to insights on what to do and how to do it to "materialize the prediction".

In terms of AI and data processing trends, what is Zettafox currently working on?

We are building on three major capabilities along the data processing chain: first, data architecture and how to optimally gather and organize their data to facilitate extraction for analysis; second, data science and how to efficiently work through all steps and tools of a full analytics software stack and derive superior insights and, third, software development looking at core algorithms and customised visualization developments.

By analysing and digging deeper through available data sets and running powerful machine learning algorithms in a state-of-the-art lab, we can also address customer analytics, risk analytics and other application types that require a granular, exhaustive, unbiased, bottom-up approach to data exploration.

Are there any dedicated AI tools for the hotel sector and how can they be applied?

We are building dedicated tools for the hotel sector based on the type of hotel, location, amenities they offer, as well as what segment of customer acquisition they should be focusing on. For instance, AI can be used to give Loyalty Card programmes more consistency, as well as build a more personalised customer journey. This is a useful trend, as Loyalty Card success tends to have a positive impact on hotel growth when there is best in class customer fulfilment. Also, through the use of algorithms, AI helps hotels analyse the past data to better analyse the future. Today, there are Internet of Things (IoT) tools being developed that will act as independent machines to help analyse data to process on the spot and give results in real time.

Do you have examples of how hotels are currently using AI in real time?

Digital is already a big part of our lives and a few hotels have started to use AI in real time. The key focus here is by linking the profile of the customer with the profile of the hotel to help engage with the customer even before their arrival and so provide a personalised experience. For instance, providing automated-check-in options for guests adds to their comfort and improves their experience on arrival which, in turn, increases

customer satisfaction with the hotel. The check-in kiosk machine and/or the hotel self-service app is available 24/7 presenting opportunities to increase revenue through cross-selling services. By offering paid upgrades, extra services and amenities or packages with added value, for example.

Smart pricing is another area hotels are using to boost their sales and profit margins. Smart pricing automatically monitors the competitor's price and gives the hotel the opportunity to adjust their prices accordingly and instantly.

How is AI helping to deliver a more personalised service?

Personalised services are becoming a reality across the hotel industry. Travelers expect a customised hotel stay, and a few brands are using technology, social media, and other advancements to provide a more customized involvement. Due to system interoperability, guest data can be stored accurately in the hotel Property Management System (PMS) and will be accessible the next time the same guest visits the property. Such data can include previously occupied rooms, special requirements and notes, and any customer preferences.



Imagine this: you leave your hotel with the lights dimmed half-way, your favourite channel is on the television, and the temperature is set to your preference. Then, two weeks later you return to the same hotel, and you find the room exactly the way you left it, except the room number is different. Such personalisation engages customers, and engaged customers have a higher level of trust, loyalty, and commitment to the brand.

(5) Zettafox is a pioneering prescriptive analytics and data science specialist. It was acquired by Mazars in 2017.

MANAGING AI DATA CONCERNS

With data collection at the heart of AI innovation, the hospitality industry needs to be alive to customer concerns on data use and ensure they remain compliant in the face of potential increased regulatory scrutiny.

The recent scandal involving UK-based consulting firm Cambridge Analytica, which used personal information from social media sources without gaining direct consent, highlights the potential for organisations to fall foul of misuse of data regulation. While hospitality organisations will already have processes in place to deal with the European Union's General Data Protection Regulation (GDPR) that came into effect in May 2018 affecting the collection and processing of European citizens' personal data wherever they are in the world, the increased use of AI adds complexities that the hospitality industry needs to manage in order to remain compliant.

Alongside GDPR, which gives consumers more control over their personal data, New York City's recent algorithmic decision-making transparency legislation shows that AI is firmly on the regulatory radar. Generally speaking, algorithms are used to determine what are described as 'life changing events' so access to finance, applications for schools and housing as well as determining fraudulent events. So while the hospitality industry may not be the primary focus of algorithmic legislation, guest personal data held by the hospitality industry may still be deemed sensitive, particularly as it such data is shared on a global basis.

Guest buy-in of data use is also crucial. While our survey suggests that 84% of travelers are willing to share their data, there are national discrepancies between the kind of information people are ready to share. For example, people from China are

the readiest to share information that France, Germany, UK and US considered as private and confidential. Twenty-four percent of Chinese people interviewed were ready to give their social media profile against 9% overall, 19% are happy to give access to their personal mobile application against 8% overall and 11% would give access to their personal photo gallery against 5% overall.

So what does the hospitality industry need to consider? After all, the collection of personal data plays a pivotal role in the ability to offer better targeted guest services. But it can also compromise guest privacy as data piracy becomes more sophisticated. So as well as strong security walls to protect data, building specific user experience consent frameworks that comply with data protection principles around customer consent and identity can help to ensure digitization programmes remain compliant and on track.

A further consideration is to ensure that AI technology used can deliver traceability, so that organisations can easily follow the reasoning to decisions made so that any regulatory scrutiny can be answered with confidence. Transparency is equally important from both a customer and regulatory aspect so that all players can identify what information is held, why and where so that access to personal information requests can be dealt with efficiently. Clearly stating on websites and apps that functional and analytical cookies are used is good practice.

However, new technologies such as blockchain are emerging that will help take the complexity out of AI data use and help to promote trust. Essentially, blockchain is a public digital ledger of transactions. The transactions or 'blocks' are held in a database and information cannot be altered, which makes it secure. While information is accessible, it is not stored in one place which means it is not as vulnerable to cyber-attack. It is also time-stamped so it is both traceable and transparent.

So far, blockchain is being explored by the hospitality industry for a range of uses. Secure Payments is probably the most practical use for such technology. But equally, blockchain can be used for a shared digital database for ID and security purposes. Other uses relate to the storage of digital tokens linked to loyalty programmes as well as centralised baggage tracking data.

As well as exploring new and exiting innovations to protect data, the hospitality industry can also set itself up as best in class users of data by helping guests understand the benefits of data collection and be open and transparent on how it uses that data.

FIVE WAYS THE HOSPITALITY INDUSTRY IS DEVELOPING BLOCKCHAIN-BASED SERVICES

1.

TUI Bed-Swap – Inventory within Blockchain

The technology allows TUI to assess demand and move inventories between different points of sale, in real-time. From there, it can flex selling margins based on demand.

2.

LockChain – Direct Marketplace with 0% Commission

LockChain allows hotels and other hospitality companies to rent out their property. It is an all-in-one platform, allowing both property management and payment to occur in one place. The decentralised booking engine cuts out 'middlemen' and another major advantage is that LockChain operates a subscription model, with a zero percent commission policy.

3.

Trippki – Loyalty Reward System via Blockchain

Trippki cuts out third-party involvement and provides a direct connection between hotels and customers. Customers are rewarded with native 'TRIP' tokens for staying at a hotel, or using hotel amenities. The TRIP tokens are recorded in the ledger, do not expire and can be used to book future visits, or can be exchanged for cash.

4.

ShoCard & SITA – Identity Management

ShoCard & SITA allows customers' ID details to be stored on the blockchain, in a decentralised, standardised format, allowing travel and hospitality companies to retrieve and verify a customer's identity at any time, from anywhere.

5.

Winding Tree – Booking and Baggage Tracking

Winding Tree is a blockchain booking and baggage open source system with a lack of third-party involvement and greater transparency and traceability when it comes to baggage tracking services.



05

WHAT'S NEXT?

The hospitality industry has constantly evolved and transformed in order to meet the changing needs of travelers. So what next? It could be argued that the recent advancement in technology is simply the next step for an industry that has always embraced innovation to cater for guests' needs. However, with AI set to touch every aspect of life in the future, the industry's approach - to what the World Economic Forum is calling the 4th Industrial Revolution - will need more careful consideration.

One of the major challenges for the hospitality industry is the shift of power that AI brings. Disruptive technology not only opens the door for non-traditional players, it also gives travelers the freedom to research, book and pay for trips independently through their smart devices. With touch points expanding, how the industry interacts with such change will be crucial to future success.

With the speed of technological change increasing, the agility of businesses to react will also be key. Nor will it be sufficient to second-guess evolving customer expectations. As our survey shows, the experience and expectation of AI by travelers is complex and not only influenced by economic status, but also by nationality, culture and age. It's important, therefore, that the industry has the most appropriate tools and processes to gather and understand different traveler needs and perspectives in order to customise their AI strategy accordingly.

With AI and the Internet of Things set to change how business is conducted, the impact on internal processes and the wider supply chain is now as important as the impact it has on the guest experience. Both sides of this particular equation have to be in sync in order to be effective. Ensuring there is an integrated and unified approach to any AI-led strategy will therefore be critical.

As we move to a more data sensitive era, security and transparency will become more important to travelers. Who holds their data and for what purpose will need careful management. The

expectation on AI to help the industry become more sustainable through its capacity to manage precious resources and reduce disruption to local cultures will be equally high. Here, the ability to use AI as a force for good needs to be brought to the higher attention of travelers, not only to emphasize future sustainability plans but also achievements so far.

While AI will force the industry to reinvent certain aspects of its approach, at the same time the industry has an exceptional opportunity to use AI to its advantage. International tourist arrivals are predicted to reach 1.8 billion by 2030 (6), with lucrative new and emerging travel markets in China and Asia set to maintain healthy industry growth. Going forward, a greater understanding of the issues, collaborations and partnerships will be increasingly important tactics to stay ahead of what is an ever-changing game.

(6) <http://cf.cdn.unwto.org/sites/all/files/pdf/1.1.-wtc-2016-john-kester-tourism-future-trends-beyond-2030.pdf>

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