

DIGITALIZATION IN HOTEL ASSET MANAGEMENT THE CASE OF DUBAI

Nijat ALIYEV

The Emirates Academy of Hospitality Management, United Arab Emirates
nijat_aliyev@yahoo.com

William David BRICE

California State University Dominguez Hills, United States
wbrice@csudh.edu

Sanjay NADKARNI

The Emirates Academy of Hospitality Management, United Arab Emirates
sanjay.nadkarni@eahm.ae

Marcus A. ROTHENBERGER

Lee Business School University of Nevada Las Vegas, United States
marcus.Rothenberger@unlv.edu

Natasa CHRISTODOULIDOU

College of Business Administration and Public Policy, California State University Dominguez Hills, United States
christodoulidou@csudh.edu

Abstract:

This study explores adopting digitalization in the hospitality industry. This includes the importance of digital tools, relevant technologies, and industry challenges that exist due to lack of asset management digitalization. Qualitative data was collected from interview samples of ten hotel industry asset managers, IT executives, and technology suppliers. Respondents agreed that the Dubai hospitality industry has the potential to collect a significant amount of data; however is unable to utilize it in an effective way. Respondents also observed that local hospitality management perceived a low value for digitalization. Findings suggest that introducing digital tools has not been a management priority along with a low awareness of tools and benefits. Further, findings imply that the Dubai hospitality industry is not ready to introduce these technologies. Very few Dubai hotels offer mobile app-based services to guests.

Key words: Hotels, Digitalization, Asset Management, Hotel Technology.

JEL classification: M1, M15, Z32, Z39.

Received 6 November 2023; Accepted 7 February 2024

INTRODUCTION

This studies' purpose is to highlight the importance of digitalization in the hospitality industry using examples from the Dubai hotel industry. The Dubai hospitality sector has seen substantial growth in recent years. Digitalization has lagged behind, although hotels may obtain a competitive advantage through adoption of technologies (Nadkarni et al, 2019). This article explores how hotels can implement digital technologies. The following research questions are addressed:

1. How important is digitalization for the hospitality industry?
2. How can asset managers use digital initiatives to improve hotel performance in areas, such as guest experience, operational efficiency, and profitability?
3. What are the key digital technologies in the hospitality industry?

According to Degryse (2016), digitalization can be compared to the industrial revolution and significantly affects all business sectors. Hansen and Owen (1995) were among the first to express a need for technological breakthroughs in hotels; already in the 1990s, they had highlighted concepts

of “smart card” hotel keys and automated kiosks for check-in and check-out. Companies must have a clear vision and mission to lead in digitalization regardless of industry. However, the literature also discusses major technology adoption failures, such as the cases of P&G and General Electric; which illustrate how digital transformations can go wrong (HotelTechReport, 2019).

Statista conducted a survey concerning the attractiveness of tech devices by age (Statista, 2020). Smart phones were the favorite up to the age of 64, with the 65+ generation using a mix of smart phones and desktops. Another survey by PricewaterhouseCoopers (PwC, 2017) shows that up to 50 percent of hotel guests will be millennial travelers – a group accustomed to technology and smart devices (Shukla, 2019).

This study investigates how advanced hotel digital technology may improve hotel performance, guest experience, operational efficiency, and profitability. Such technologies include but are not limited to: Artificial Intelligence, Drones, IoT and Robotics which power hotel mobile apps, chatbots, self-check-in and out, keyless room entry, in-room iPads for guest room management, automated food and amenities delivery, mirror TV, and more. This paper argues that, to gain a competitive advantage, the hospitality industry should introduce Industry 4.0 advanced technologies.

LITERATURE REVIEW

An organization’s policy of asset management represents the primary framework that demonstrates investor objectives and strategies (The IAM, 2015). The foremost goal of a hospitality asset manager is to ensure that all the hotels or assets within the portfolio achieve investors’ objectives, optimum operational and financial performance, and maximum return on assets through proactive asset management techniques (Jackson, 2013).

Asset management can be transformed in every aspect by end-to-end digital solutions: client intake, improving service delivery and turnaround time, cost reduction, optimizing portfolio returns, and minimizing risks (Gach & Tobin, 2014). Asset management plans may differ from one organization to another, to find the right balance of objectives and strategies, but policy must clearly state how the company will convert investors’ objectives into the asset management plan. Of all the changes that an asset manager confronts, the digital technology revolution has the greatest potential to transform the industry (Gach & Tobin, 2014).

During the COVID pandemic, a rapid migration towards digitalization has occurred and is expected to continue into the recovery. A large part of the hospitality industry has moved to digitalization to cope with the pandemic, since guests also turn to digital tools for their non-interactive transactions and employees are working remotely. According to the McKinsey COVID sentiments survey, 75 percent of first-time users of digital channels will continue to rely on digital technology even after a return to normality (Baig et al., 2020).

Asset Management: Hotels are a significant segment of the commercial real estate industry (Singh et al., 2012). The UAE hotel industry is led by Dubai, with over 200 new projects (Albawaba, 2018). Asset managers are crucial to ensure portfolio growth (Michels & Taylor, 2018) and to maximize returns (Crandell, 2016). Asset managers play key roles throughout the investment cycle, setting up strategies and managing performance (Singh et al., 2012).

Lack of interest in digitalization by asset management will result in damaging asset reputation (Alcatel-Lucent, 2018). According to a 2018 Alcatel-Lucent survey, only 22 percent of hotels felt they lead in digital guest engagement, while 20 percent identified as leaders in guest mobility, and 12 percent claimed to lead in IoT (Alcatel-Lucent, 2018). The VP of Asset Management at Benchmark Owner Advisory Group has stressed the importance of data analytics for hotels, because of the large quantities of data generated in the industry (Arlotta, 2018). The ability to analyze data dynamically can positively affect the profits in the hospitality industry. Thus, it is an area that asset managers should target (Arlotta, 2018).

PwC explains how IoT-related technology implementation can improve the guest journey from check-in through check-out, engaging with guests in real-time via mobile devices (Shukla, 2019). Hotel mobile applications can be interfaced with Property Management Systems (PMS) for guests to check-in and check-out without queuing.

According to Cushman and Wakefield, real estate asset management is not simply managing a building, but is more about creating a skills ecosystem; implementing technologies and developing systems to increase asset value, sustainability, and profitability (Revon, 2020).

Consumers' experiences involve experiencing a firm's brand, values, vision, products, and brands across multiple platforms, before progressing to the purchase decision (Scardina, 2020). Thus, an asset manager's strategies should evolve according to market conditions. Being an asset manager may require performing the following tasks (Schementi, 2020):

- Acquisitions, build-to-suit, and dispositions
- Flexible place of work and co-working consultancy
- Detailed analysis of labor, demographic, market, and sustainability
- Lease restructuring
- Managing sublease analysis
- Site selection
- Strategic consulting

Asset managers represent owners and implement strategies in line with ownership objectives (MacNair, 2010). They understand owner expectations and create long-term plans for property improvement to increase value and reputation. Property operators may not always understand these objectives, as they have a different perspective (Cornell University, 2016). Most relationships between owners and operators involve management or franchise agreements. Fundamental terms are established in the agreement, and asset managers spend most of their time with the operator, not the owner (Cornell University, 2016). Owners and Hotel Management Companies rarely meet with each other but the asset manager is in a key position between both parties (Cimini, 2014).

COVID-19 affected the hospitality industry more than almost any other event, because of travel bans and the speed at which new variants spread. The CEO of Marriott Hotels mentioned that the pandemic is having a more severe financial impact on tourism than 9/11 and the 2009 financial crisis combined. In the first quarter of 2020, Marriott hotel revenues declined 25 percent globally with 75 percent of properties below normal occupancy; many hotels were forced to close and those that are open offering only skeleton services (Hospitality and Catering News, 2020).

The CEO of IHG echoed a similar message, "Demand for hotels is currently at the lowest levels we've ever seen. IHG has a robust business model and the measures we are announcing today to reduce costs and preserve cash give us the capacity to manage the business through this unique environment and to support our owners during this incredibly difficult time" (Brandler, 2020). Black swan events such as H1N1, SARS, 9/11, and COVID-19 cannot be predicted, but, when such events happen, they affect society and economic behavior negatively. During these events, asset managers must turn to innovative and digital ways to manage costs, revenue, and customer service (Slors, 2020).

Digitalization: Digitalization is the conversion of analog information to digital. Digital information is easier to access, store, share, and process (Tilson, Lyytinen, & Sorensen, 2010; Yoo, Lyytinen, Boland, Berente, Gaskin, Schutz, & Srinivasan, 2010). Digital culture in any organization has some unique characteristics, such as no physical boundaries, no socio-economic, racial or ethnic hierarchies, and is accessible by anyone (Kaufman & Horton, 2015).

While many firms have moved to adopt digital technologies, very few have successfully integrated these technologies into the investment management lifecycle. Digitalization can provide a significant competitive advantage to asset managers and their firms on many fronts such as: asset performance, more effective strategies, faster growth, and improved segmentation and targeting of key customer groups (Gach & Tobin, 2014). Companies wishing to digitalize know the value of

digital technology; however, they need to learn and understand digital strategies, tactics, and implementation (Kaufman & Horton, 2015). An asset manager must understand that digitalization is not something readily available to buy and implement, but is a very carefully thought out process. Failures are costly and, according to Davenport and Westerman (2018), digital transformation must be seen as something that involves participation of all of the firm's employees.

Hotels usually implement technologies as a value-added feature to promote product differentiation, improve guest satisfaction, and create customer loyalty. A Gartner Consulting Group Senior VP and Head of Research said at the 2013 Future of Digital Technologies Conference that, "Many vendors on top of the IT world today will likely not be the IT leaders of tomorrow in the Digital Industrial Economy." He noted the main reasons were that these organizations have old-fashioned strategies, ecosystems, and sales forces (Kaufman & Horton, 2015). A McKinsey survey of more than 20 asset-management firms found that digital leaders reduced costs significantly, achieved superior financial performance, and outperformed peers (Baghai et al., 2018).

Emerging Technologies: New technologies are transforming every aspect of the consumer experience (Hernandez, Conway, & Knight, 2018). A KPMG study reveals that 61 percent of companies that are effective at using digital technologies see higher revenues than their competitors, only 32 percent of organizations have clear digital strategies and missions, and nearly 8 out of 10 CIOs admit that their digital strategy is only moderately effective (Paul, 2018). A selection of key themes from the KPMG study are listed below:

Industry 4.0

Industry 4.0, the fourth industrial revolution also known as the "Industrial Internet" or "Digital Factory", focuses on the end-to-end digitalization of all physical assets; to integrate into a digital ecosystem with value chain partners (Geissbauer, Vedso, & Schrauf, 2016). Industry 4.0 generates, analyzes, and communicates data flawlessly and, according to the PwC (2017) survey with over 2000 participants from 26 countries, it was predicted that companies worldwide were planning to dramatically increase digitalization by 30-40 percent in the next five years (Geissbauer et al., 2016).

Even before the COVID-19 pandemic industries were transitioning to Industry 4.0 technology, but during the pandemic has gained even greater popularity (Agarwal, Eloit, Mancini, & Patel, 2020). Industry leaders are focused on digitizing industry functions within the internal vertical operation process, along with horizontal value chain partners, and in enhancing product offerings with digital functionalities (Geissbauer et al., 2016).

Blockchain

Blockchain is a digital database requiring a strong computer network (Gupta, 2017). Blockchain transactions are a digital ledger of transactions with a high level of security and integrity, for payment and contract management systems (Hernandez et al., 2018). It is used with cryptocurrencies but has a far larger scope in the payment industry. Many large corporations and industries have started to apply Blockchain to manage customer data. Blockchain transaction records cannot be altered or removed, nor can sequence be altered; providing an unchallengeable, tamper-proof data storage and management system (Gupta, 2017). A Blockchain platform is exceptionally difficult, if not impossible, to hack because the data is stored in several computers and transactions are encrypted (Crosby et al., 2016).

As per a Gartner study, a majority of IoT (Internet of Things) technology adopters have begun to adopt Blockchain technology to combine with their IoT networks (Costello, 2019). Blockchain technology is in the very early phase of travel and tourism industry adaptation, but has increased fast enough to become a requirement.

IoT

The Internet of Things (IoT) is the collecting and sharing of data between an ensemble of interconnected sensors. The term IoT is usually used for devices that are not generally expected to have an internet connection. Personal computers and smartphones are not usually considered IoT devices (Ranger, 2020).

There are already more connected IoT devices than there are people in the world; Connected IoT devices will reach 41.6 billion by 2025 (Ranger, 2020). Security is the major concern hindering IoT deployment. IoT devices often suffer from security weaknesses making them easy targets for hacking (Jain, 2020). IoT features, such as beacons, interactive mirrors, connected thermostats, and hyper-personalization, can play an important role delivering better guest experience and product differentiation. It allows guests to control room functions from smartphones, such as lighting, temperature, curtains, and food ordering (Shukla, 2019).

AI

Artificial Intelligence (AI) has advanced substantially and AI bots provide instant support functions to customers, enabling communication across apps, instant messaging, and online platforms (Hernandez et al., 2018). The 2017 Deloitte State of Cognitive Survey found that, among 250 of the most aggressive corporate adopters of cognitive technologies, 76 percent believed cognitive technologies would substantially transform their organizations and that the most beneficial technologies would be Robotic Process Automation, Statistical Machine Learning, and Natural Language Processing. Although cognitive technologies are in the early stages of adoption, a large number of companies are increasingly using this technology (Davenport, Loucks, & Schatsky, 2017).

Drones

Drone technology is rapidly developing but still in an infancy stage in terms of possible applications and widespread usage (Joshi, 2019). Some current commercial applications are:

- Aerial photography for social events, journalism films, etc.
- Shipping and delivery of items
- Analyzing or supplying necessities to disaster-hit areas
- Search and rescue operations via thermal sensor drones
- Topographical mapping of unreachable locations
- Inspections of construction/building safety
- Agricultural use
- Unmanned cargo transport
- Law enforcement and border control surveillance
- Storm tracking and forecasting hurricanes and tornadoes

Voice/ Natural Language Processing (NLP)

Natural Language Processing (NLP) is a branch of artificial intelligence that focuses on the interpretation and manipulation of human-generated written or spoken data (Rangasamy, Nadenichek, Rayasam, & Sozdatelev, 2018). NLP can understand, speak, and write in human languages; extracting meaning and making appropriate decisions (Marr, 2019). According to Deloitte Insights, governments world-wide are fast-tracking digitalization; some key NLP capabilities identified by Eggers, Malik, & Gracie, (2019) are:

- Sentiment analysis
- Topic modeling
- Text categorization
- Text clustering
- Information extraction
- Named entity resolution

- Relationship extractions

NLP in hospitality is new, however, it can be used to build systems that can book, check-in, check-out, handle guest complaints and queries, and many other customer service functions, which would be available round the clock without staff involvement (Sciant, 2020).

Augmented and Virtual Reality (AR and VR)

Augmented Reality (AR) is a technology that enhances the user's actual environment with computer-generated sound, video, or graphics (Eckert, Loop, & Berlin, 2017). Virtual Reality (VR) technology generates highly realistic images and sounds that immerses users into a complete different setting, by creating computer-generated simulations where users interact within the simulation (Eckert et al., 2017). AR and VR have moved to many industries beyond gaming, such as practical training where employees can be put into simulated hazardous or critical situations without actual risk (Likens, 2020).

AR and VR can support hospitality with virtual tours, interactive hotel rooms, and virtual travel experiences (Kutsenko, 2019). According to PwC Global, AR and VR are expected to be a \$357.6 billion industry by 2030 (Dalton & Liu, 2020). Hotel VR technology implementation can increase online revenue by up to 135 percent, compared to hotels without VR; with many international hotel chains such as Intercontinental Hotels & Resorts, Marriott, Shangri-La, and Best Western, implementing it (Shukla, 2019).

Robotic Process Automation (RPA)

Robotic Process Automation (RPA) is the use of humanoid robots or virtual agents that improve, automate and assist human activities; and are capable of processing transactions, responding to input, data manipulation, and can communicate with other digital systems (Osinubi, 2018). According to a 2018 McKinsey automation survey, three-quarters of participants had either already initiated RPA or were about to begin (Didion, Hernandez, Kaushik, & Masri, 2019). Bots in hotels have become more common in performing routine employee tasks and reducing operational costs (Shukla, 2019).

METHODOLOGY

Qualitative data was collected through semi-structured interviews. Interview question design was informed by the literature. A non-probability sample of 10 interviewees was used and all participants were in managerial roles associated with hotel asset management. Their affiliations included hotel asset managers, advisers, consultants and vendors. A pilot interview was conducted, in order to make final adjustments to interview questions. The pilot participant was a Vice President of Asset Management currently managing several 5-star Dubai hotels with more than 18 years of experience in the hospitality industry. The remaining participants were also Hospitality Asset Managers with industry experience ranging from 7 to 26 years. All participants were aware of hospitality digitalization.

RESULTS

Q1: As an asset manager, how do you think introducing digital aspects will positively impact hospitality asset management?

Eight out of ten interviewees stated that digitalization has a positive impact on hospitality asset management and hotel operations as highlighted by Hernandez et al. (2018). Four interviewees emphasized that digitalization will not only lead to the collection of data which can be used to track guest hotel spending but will also provide increased customer satisfaction. P2 said, *"There is vast potential in introducing new technologies into the hospitality sector, and once you do, you can reap large benefits, such as analyzing guest spending, segmentation, and guest*

sentiments. The most positive impact is achievement of higher guest satisfaction.” P6 said, “... in order to capture and understand the data, to make it seamless and comprehensive, and to analyze it etc., you need to implement digitalization to support an asset management analysis.” This was followed by P8 stating that, “... this is very important to control costs, to improve product quality, and improve customer outcomes.” P9 said, “... what is the key for us is that we digitalize guest experience especially before and after the stay.”

Four interviewees pointed out that hospitality industry digitalization will bring greater effectiveness in making timely and smarter decisions by owners, operators, asset managers, and operational teams; as was highlighted by Khan, Rahul, and Lanawat (2017). P2 said, “... with technology, hotels can encourage guests to share bad experiences in person or using any communication channel so that corrective actions can be taken on the spot.” P3 supported this and stated, that, “... the better the quality of data at your disposal, the better decisions that you can make. It means you can make decisions faster.” P4 stated that, “... digitalization is the ability to increase data you have, which then allows you to do a number of things effectively.” P8 said, “... now is the right time for the hospitality industry to see this value and make the move to digitalization.”

Q2: How do you see digitalization in hospitality asset management as a value creation aspect?

Interviewees highlighted cost savings, better profitability, and higher customer satisfaction, as value creation aspects in asset. Four interviewees emphasized that hospitality digital technology implementation will produce greater customer satisfaction. P1 stated, “... *this [digitalization] will contribute also to an improvement of the guest experience itself.*” This was supported by P2 who stated, “... *based on all the data, analytics can be performed and then you can make the guests’ future stays more memorable.*” P5 said, “*It [digitalization] can be very valuable so if you go by, we can actually have a remote device monitoring different staff, different things that are there, so we can monitor the customer satisfaction.*” It was further noted by P7 who stated, “*Guests who find this [digitalization] are very highly likely to come back or refer to friends as I have seen in our experience.*”

Six interviewees emphasized cost-saving which could result from digital implementation and upgraded technologies, ultimately resulting in greater profitability; as also stated by Baghai et al. (2018), that digital leaders have reduced their costs significantly, achieved superior financial performance, and outperformed peers. P2 stated during the interview that, “... *as I mentioned earlier that guest satisfaction and cost effectiveness are very commendable by introducing these technologies; ... other digitalization initiatives, like mobile app, integrating third party APIs within your website open a vast door of opportunities to generate revenues and increase the profitability, so, which again is an important task of asset management.*” This statement was supported by P3, P4, P5, P6, and P7.

Three interviewees highlighted that data collected with digital tools would create value for asset management and hotel operations. P2 stated, “... *these examples [Blockchain, chatbots] of digital initiatives, which operators, hotels or owners can initiate in their properties, and all the steps towards digitalization creates value.*” P3 supported the statement stating that, “... *[digitalization] ultimately will create a better Net Operating Profit, and therefore, also a better value from asset perspective.*” P6 stated that, “*I think all the asset managers need to turn to digitalize more, at least all the processes, all the information, personal information, and to make it more simple in order to create that value.*”

Q3: As Millennials will form a large portion of travelers, how do you think mobile technologies will have a significant impact on the hospitality industry?

Seven out of ten interviewees agreed that the hotel industry should use mobile-related technology for the majority of the hotel's services, including reservations, check-in and check-out,

in-room services, food and beverage orders, and concierge services, to ensure the delivery of uninterrupted and intelligent services to the customer as emphasized by Gretzel et al. (2015a). P2 stated, *"They [Millennials] would love to book a room from a mobile or mobile app, they would love to check-in before even coming to hotel, or check-out without passing by the reception to avoid queues."* P3 stated, *"It [mobile technology] is the revolution that is happening at 360 degrees within the hotel and hospitality in general."* P4 said, *"... in my mind, the ultimate model for hospitality is with your own [mobile] apps, and with mobile apps you can remove all frictions for check-in and check-out and you can target your customers more effectively."* P5 further supported this by stating, *"... they [Millennials] actually like to do lots of things by their phones."* P6 highlighted that *"... it could be that around 70-75 percent of bookings, or even more, are made through mobile technology, through a smartphone."* P7 stated, *"It [mobile technology] got to a level which frustrates people when they cannot find services or answers to the inquiries on their phone."* The interviewees suggested that by upgrading hotel services to digital and mobile platforms, there would be a significant increase in customer satisfaction; as hotel staff will have more time to serve the guest rather than performing formalities which guests can perform on their own as also mentioned by Gretzel et al. (2015b).

Q4: What do you think about the role of robotics in the Dubai hospitality industry over the next 5 years?

Overall, interviewees believe that robotics' role in the hospitality industry is important; as Osinubi (2018) stated, robotics will improve, automate, assist in performing human activities, and can communicate with other digital systems. P1 stated, *"... presence of the robotics will be really important in the hospitality industry."* However, low awareness of robotics technology by industry professionals has hindered its implementation and growth. P2 stated that, *"The local industry professionals need a decent education to understand the long term benefits of robotics in hospitality industry."* P7 stated, *"... people here have not been thinking out of the box how to bring about changes in the guest journey [with robotics technology]."*

Individual properties within Dubai are testing robotics technology on a smaller level; as Shukla (2019) highlighted, robotics has just began to be utilizing in the hospitality industry. Two participants mentioned that implementation in Dubai is at a low level. P5 said, *"Currently, robotics role in Dubai hospitality I don't see at a very large extent. Currently there are other countries who are utilizing at a much higher level."* P7 stated, *"... I think it [robotics] is a little bit early in the game, robots have not raised their levels."*

The majority of participants forecasted that the next five years will be very important for the boost of robotics technology in Dubai; as P5 stated, *"In the next five years I think there will be a drastic change."* P2 supported this and stated, *"I see that next 5 to 7 years maybe the boom of robotics in Dubai market as it [robotics technology] is adopted in international markets."* P8 was very confident about the future of robotics, stating, *"... we are working on this project, so for me it is a bit early to jump on conclusion here, lot of trials are happening on group and individual hotel levels."* P8 further stated that, *"I think in five years, the demand and people acceptance will be higher of course, and we will have some case studies and research examples in hand."* P9 suggests that, *"... in the next five years down the line, I would see more on the back of the house but not much in front of the house."*

Q5: To what extent do you think technology, such as IoT, NLP, and Blockchain, can play a role in improving service quality in Dubai hotels?

The majority agreed that implementation of technologies, such as IoT, NLP, and Blockchain, will increase guest satisfaction. P1 stated that, *"... [IoT, NLP and Blockchain] definitely something that will bring ease to the entire process of check-in and check-out, also guest billing."* P2 supported the statement by saying that, *"... [it] can be very useful in the hotels"*

websites and chatting bots for pre stay or during stay, even the post stay, it can be very beneficial." P3 emphasized the same point, stating that, "... *that is again, immediate, flawless, no possible mistakes, and also better service.*" This was supported by P4 and P5.

The majority of interviewees agreed that these technologies, if implemented correctly, will result in enhanced guest experience. P2 stated, "... *once it comes, it [IoT, NLP, Blockchain] will definitely change the whole customer's journey in very, very positive way.*" P5 stated, "*So, these [IoT, NLP, Blockchain] different technologies that might come in the future and will improve a lot for the services in Dubai hotels.*" According to P10, "... *and this is all related to improving the service delivery in our hotels.*"

One of the interviewees emphasized the fact that technology implementation will increase revenues and decrease costs; as Likens (2020) states that the PriceWaterhouseCoopers survey found 47 percent of participating companies agree that these technologies will reduce cost. P7 stated that, "... *classic use of Blockchain to optimize room revenues and also reduce the costs,*" and that, "*IoT can bring back a lot of efficiency, cost savings, improvement in operations.*" P7 further stated that, "*A Blockchain can bring a lot of transparency; can bring a lot of efficiency [and] it [NLP] helps reduce manpower, reduces training of people.*"

Several highlighted that these technologies are in the infancy stage and have yet to realize their potential; as P5 explained, "... *you can say that technology has not been discovered to a full potential ... but yes, slowly and gradually that is coming into a picture. ... Blockchain, I have serious doubts. For me, Blockchain ... there is still a lot of growth there.*" A similar statement was given by P9, stating that, "... *the deployments [of Blockchain] are not so great, they are slow and not really fit for purpose.*"

Q6: A significant shift to digital strategies was noticed in almost every hotel chain during the pandemic. How do you think adapting digitalization earlier would have helped improve hotel operations?

Two highlighted the importance of an effective strategy. P2 stated that, "*But the lesson is learned for the future situations, and businesses should be ready to set effective digital strategies to deal accordingly.*" P6 said that management, operator, or owners have to execute the digital strategy effectively and stated, "*But if it [digital planning] is wisely done and wisely implemented, then definitely yes [it will help] and in pandemic – absolutely.*"

Three of the interviewees agreed that the pandemic has played a significant role in the quick rollout of hospitality digital technology due to social distancing, hygiene, and other reasons. This was supported by several interviewees such as P2 stating, "... *I think the hotels which suffered the most, they were not even digitalized, they were not even close to digital transformation ... which felt the hit of pandemic.*" P3 supported this statement: "*I am surprised that we have all been digitalized six times the normal speed in the last six months because of COVID.*" Similar thoughts were shared by P4, stating that, "*Absolutely, I mean you would have sprinting out of the gate, you wouldn't have had to apply massive resources and time to try to do it now.*" Baig et al. (2020) indicated that the pandemic has caused a rapid migration of digitalization. P8 contradicted this, stating that, "*I don't think that adapting this technology [before pandemic] and digital platform would have helped us*"; however, P8 acknowledged that pandemic has accelerated the digitalization in the hospitality industry and said, "*However, what I can be sure of that COVID actually has accelerated the technology adoption in our hotel industry.*" P9 supported this by stating that, "*I am not so sure about this one ... so, I think the hype was a bit more than exact reality.*"

Two interviewees expressed concern about insufficient infrastructure. P3 highlighted that, "... *there are no physical space and technology infrastructure available.*" P9 referred to the example of the Dubai airport's seamless experience stating, "*The beauty would be having something like we have in Dubai airport, where it's fully touchless; where you can walk from car to plane without touching anything, just by facial recognition.*" P9 further stated, "... *we [hotels] are away a long way because of local regulation.*" One interviewee suggested that digital

implementation would produce an enhanced guest experience; as P8 stated, “... *so for me, those that make the right investment and leverage digital technology to improve and elevate their guest offering, will be in the best position to survive pandemic.*”

Q7: The world is evolving fast, with 400m connected devices in 2010 to 30 billion plus devices in 2020. How should hotels operate/update their technologies?

All stressed the importance of technology, emphasizing that timely adoption and upgrading are mandatory to gain a competitive advantage. P2 stated, “... *I see that to be successful and visible in the market, and to achieve competitive advantage, I think it will become a major requirement to be digitally enabled.*” Interviewees also suggested that not being digitally enabled may result in loss of market share. Another interviewee highlighted technology’s limited lifespan and continuous upgrades; therefore businesses should carefully choose the right technology; as P3 stated, “... *unfortunately, technology has a very limited lifespan, so in 6-12 months ... need to catch up with the technology.*” P6 suggested that hotel owners and operators should not invest heavily in the technology, but instead find the right technology partners to invest on the hotel’s behalf. P6 further suggested that hotels should have leverage with technology partners so that the hotel can change partners as and when required.

One of the interviewees indicated that data and analytical statistics are better suited at the corporate headquarters level; as P4 said, “*I am not sure that every brand is really focused on this; I think the data and analytics may probably have more value to the corporate owners more often than it does to the hotel brands.*” On the other hand, one of the interviewees pointed towards the narrow vision of IT managers; and stated, “*Unfortunately, most IT managers have conventional thought processes, which means that asset managers, owners, or managers become driven by the narrow vision [of IT leaders].*”

P8 stated, “... *so all these [hotel services] should be available on the finger tips [of the guests] so he can open his mobile and I believe a lot in BYOD [bring your own device] and BYOC [bring your own content] ... as guest prefers now to keep everything on his mobile.*” P9 suggested that the cloud will be the future of data storage, stating, “... *why should we invest in infrastructure when everything is going to the cloud. If you now put [investment] in the massive data center, it is really going to be useless.*”

Two pointed to the additional cash flow and profitability which can result due to technology implementation. P2 said, “*Tech will not only attract guests, but will also enhance the profitability of the hotels, positively affecting the owners’ cash flow.*” P4 stated that “... *each additional dollar dropping to the bottom line has a lot more value to that asset.*”

Q8: Do you think hotel industry management is utilizing hotel data appropriately to create future digital strategies?

The majority of interviewees agreed that hotels are not using data appropriately. P3 stated that, “*They [hotels] are not [using the data]; I don’t think they are doing anything whatsoever related to digitalization. They are using it for minimal parts. I guess they are scared a little bit by privacy law.*” P4 also stated that, “*they [hotels] are not [using data], candidly, I think there are horrible ... horrible laggards ... currently, they [hotels] are not utilizing it to the level they can.*” P6 said, “... *I don’t see that hotels are really optimizing and thinking about the data they have; they just have the data but they don’t know what to do with it.*” Supporting this P7 said, “... *hotels do have tons of data but in my opinion it is meaningless. Most of the large chains are still not able to connect data that is generated at various outlets.*” Similar arguments were presented by P8, P9 and P10.

Three interviewees emphasized the return on investment (ROI), return on experience (ROX), and improved guest experience that was possible if the hotels used this significant amount of data properly. P1 stated, “... *it [data] can be also used to analyze the return on experience as*

well as the customer satisfaction level.” In support of this P2 said, “... *the hotel chains must use this huge data bank to enhance the guest experience, which now you call ROX or return on guest experience, which apparently is a new measurement to calculate the ROI.*”

Interviewees suggested that hotels do not perform analytics on data they currently possess. P2 stated, “... *we [hotels] have everything so hotels should turn this data into analytics.*” P6 highlighted different aspects from a corporate level perspective, stating that, “... *they [hotels] have tons of data, that’s for sure, it’s pretty much zero what they can use from that data but they are analytical thinkers.*” P6 further commented, “... *they cannot swallow all the information they have. I think there are still 3 more years to go to be more efficient with it.*” Bhattacharjee, Seeley, and Seitzman (2017) also mentioned that travel and tourism companies are not performing at their potential in developing advanced analytics capabilities.

Q9: What could be the cost impact with and without digitalization in asset management?

Five stated that non-digitalization could be very costly and ultimately may result in losing that business. Puschmann (2017) highlighted that digitization is beneficial compared to a non-digitalized structure. P3 stated that, “... *technology digitization does not come cheap, but there is a much higher cost, which is not doing it.*” P4 also stated that, “Well, *I think optimally, if you are not digitalizing, it can cost you way more than if you are.*” On the other hand, P6 highlighted that the cost factor depends on the company vision and the outcome a company is seeking. P6 stated that, “Well, *it [cost impact] could be huge, it could be nothing. It really depends on what you are analyzing.*” P6 also mentioned that, “... *I would say that for me the impact is high; more and more, it’s because the world is more interacted and there is lot of data and information that we miss as an asset manager.*” P8 and P10 supported this narrative and emphasized that the cost of non-digitalization could be expensive.

P4 stated, “So, *based on my experience, we increased the net promoter score (NPS) 25 percent in 6 years and we are also increasing productivity and quality further. I would credit much of that to our use of data to help us to rapidly improve.*” P8 said, “*I believe that digitalization reduces client acquisitions and service cost, so the consequences of waiting for others to take the lead will ultimately impact the competitive advantage of the asset management in the market.*” P6 said, “... *So you can make decisions way much faster and that speed of decisions, at sometimes mean a lot, thousands of dollars, millions of dollars.*” Gach and Tobin (2014) also had the same understanding about improving service quality, quick turnaround time, and cost reductions.

Q10: How important is the planning of a digital path and implementing the technology in hotels?

The majority of interviewees agreed that digital path planning bears significant importance towards success in the hospitality industry. P1 said, “... *it [digital planning] is a key to many different aspects or whenever you introduce, re-look the things, or projects.*” P2 supported this and stated, “... *I think when you start talking about the digital [path], it feels like it is a very simple, easy, and fast process to achieve, but the truth is just opposite ... it is a demanding process.*” P4 emphasized that the business should base its strategy on a digital vision. P5, P6, P8, and P10 supported this.

P2 stated, “*Selecting the technologies according to business needs will always be critical and it will require attention to details.*” Supporting this, P1 said, “*We select the technologies based on our needs and we make sure the staff is prepare to use it; training is crucial to make it smooth.*” P4 also stated that strategies and planning depend on business needs and vision.

Three highlighted that planning was an important aspect. P3 stated that, “*I guess you also need to see where are the needs of the guests and the needs of the business will be in three to five years ... so you need to be more focused on end-game rather than start-game.*” P6 raised a concern about technology lifespan, stating, “... *you have to plan it, but it is difficult to plan something that*

maybe in two or three years will be obsolete.” P10 also stated, “... *better to plan much higher and we always encourage a five to ten years strategy when it comes to digital.*” One of the interviewees expressed a concern that customers need to be educated with hospitality technology. P9 said, “... *you need to embed it [technology] to the business process, you need to educate the customer about it before it’s really going to pay off.*”

Q11: Do you think that guest experience, from booking to check-out, should be completely digital – high-tech, low touch? And in what way should it be digital?

The majority of interviewees agreed on a complete digital end-to-end solution. Gach and Tobin (2014) had also suggested that business can be completely transformed in every aspect by end-to-end digital solutions. P2 said, “*Yes, I think and I believe that end-to-end digital solutions are possible, yes very much possible ... higher guest satisfaction can be achieved through the technology of the future.*” P3 supported this and stated, “*Yes, definitely, because people are in high mobility.*” P5 referred to Alibaba’s high-tech hotel, which is completely touchless and contactless, as an example.

While several participants supported end-to-end digital solutions as appropriate, it was also suggested that continued involvement of hotel staff is also required. P2 stated, “... *but I believe that hotel staff involvement will be a crucial factor. They [hotels] should still have a little bit of a human touch, but to a very limited extent.*”

On the other hand, P4 believes highly in the involvement of staff along with technology, stating, “*I actually think it should be high-tech and high-touch.*” P6 also disagreed with the high tech and low touch concept; stating, “*I don’t think so, I don’t think it should be completely digital, I just don’t think so.*” P6 noted that only 13 percent of guests use mobile as a keycard; and therefore, doesn’t see the value in a completely digital experience.

P8 highlighted challenges faced by Dubai hotels, stating, “... *there were a lot of attempts to deploy check-in and check-out online; there are some roadblocks like: I know in Dubai you can’t do full check-in because you need to present the passport, and, you need to send this passport to the government. So, there are some challenges we trying to overcome.*” P8 said, “*we are also working on face recognition, and we are looking at how to make the check-in experience seamless in the future, and not have another failure. We don’t want to repeat all these failures that happened in the past.*”

Q12: Why do you think hotels in Dubai pay less attention to digitalization, even though it is a tourism hub?

Interviewees agree that limited attention is paid to digitalization in Dubai; however, several suggested that it is an international hospitality issue. P3 stated, “*It is not only Dubai but all hotels around the world.*” P5 said that “... *they [Dubai] are very open to digitalization, they like to experience and they have brought a lot of technologies to Dubai, but they have been left behind a little.*” P7 and P9 supported this idea. However, P8 and P10 disagreed and suggested that attention has been given to hospitality digitalization but accepts that it is not up to the mark. P6 pointed to the lack of hospitality digitalization professionals in Dubai; stating, “*Well, because I don’t think they have qualified people to process that.*”

P3 raised the concern about making expensive investments in technology which do not provide immediate returns to investors; which makes it less attractive to implement. P3 stated, “*I guess Dubai is trying a bit to be at the fore-front of that, but it’s the cost that you don’t see immediate ROI [return on investment], so it’s a very expensive cost.*”

Three of the participants highlighted the point that hospitality professionals are unable to understand digitalization’s value. P3 said, “*I guess hoteliers have a very short-minded mentality because they are looking up to fill the hotel today, tomorrow and the day after tomorrow. They can’t think three years or ten years ahead.*” P4 stated, “... *I think people don’t understand what it*

[digitalization] can do for them ... I think people don't understand that every business is in the data business." P8 stated that, "... so they [hoteliers] don't believe that the digital or technology is a key in attracting the guests or bringing the guest back to hotel, so I believe this is not right."

P8 suggested that one of the reasons for not implementing digitalization in hotels is the investor mentality; stating, *"Number one reason is the investors' mentality, because their goal is to generate maximum profit, easy revenues in the short term; without proper planning for the future. In addition, I think asset management companies are not pushing for digitalization and embracing the new changes as quickly as other industries."*

Please see appended Table 1 for a summary of results.

CONCLUSION

Although the interview questions focused specifically on digitalization issues relating to asset management, the participants also provided insights on the impact of digitalization on the entire hospitality organization. Content analysis was conducted on the responses to identify themes and patterns, which are discussed in this section.

Importance of digitalization in hospitality: All interviewees agreed to the importance digitalization in hospitality. They provided insights as to how digitalization may create positive impacts in asset management and operations. The participants agreed that implementing technologies in hospitality enhances guests confidence and allows staff to focus on guest satisfaction. Digital technologies enable hospitality organizations to make timely and effective decisions in operations and asset management, resulting in cost savings and greater profitability. This is consistent with the literature. For example, Gach & Tobtin (2014) stress that asset management can be completely transformed with digital solutions. Davenport and Westerman (2018) emphasize the importance of involving employees in the implementation process for it to be a successful transition.

Digital initiatives for enhancing the hotel guest experience: Improving the guest experience creates value for asset management and hotel operations. Hotel staff can devote extra care to guests instead of taking time for check-in and check-out services. Gretzel et al. (2015b) suggests that a significant increase in customer satisfaction is possible with digital technology and this was supported by interviewees. Khan et al. (2017) emphasized building a meaningful relationship between customers and businesses using digital technology. The interviewees agreed that digitalization is a crucial factor to enhance guest satisfaction. Khan et al. (2017) and Gretzel et al. (2015b) both suggest that technology implementation is far easier and quicker now because digital technology is embedded in people's daily lives; and customers find technology comfortable and reliable. Businesses of all types have begun to adopt digital technologies to manage the COVID-19 pandemic.

Mission critical digital technologies in hospitality: According to the interviewees, the most crucial hospitality digital technologies will be IoT, mobile technology, data analytics. Torres (2018) found that most guests want to use smartphones to check in and check out, as well as for all other hotel services. Sixty-four percent of hotel guests stated that they would like to use their smartphones as room keys (Torres, 2018). A hotel smartphone app could have general hotel information, feedback and comments, hotel promotions, room check-in and check-out options, can be used as a room key, room booking, rewards program, food ordering, spa and recreation services, social media channels awareness, chatbots, and much more.

According to Jain (2020), IoT development on a large scale is hindered by security weaknesses that makes IoT devices easy targets for security breaches. The interviewees also

expressed that this technology is immature. However, a study by Gavrilović and Maksimović (2018) found that IoT leads the way in the travel, transport, and tourism industry globally, although not in the Dubai region.

The interviewees agreed on the large potential of data analytics, although asset managers currently do not focus on this technology. The reason could be the lack of understanding of its true potential. The implementation of hospitality digitalization can also be successful in hotel finance departments. A few examples of digitalization in finance include electronic invoicing (e-invoice), integrated document management, e-storage of ledgers and e-invoices, electronic payments; credit card, balance sheet, cash flow, income, and audit reconciliations.

Digitalization may also be advanced in sales and marketing. According to research by Travolution, 40 percent of millennial travelers focus on a destination that is “instagrammable”; so that posts can be tagged with an attractive location (Williams & Levitt, 2019). Influencer marketing, where hotels invite celebrities, bloggers, vloggers to write positive comments on social media, helps create a high-class image of the property while driving up ROI. These tactics are not common in Dubai and have not reached their full potential.

The digital definition, according to Gartner (2021), is “the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business.” Businesses and individuals are now expected to be dependent on digital tools and a hotel guest demands a highly efficient digital experience. Digitalization can play an important role in improving guest experience, satisfaction levels, time management, cost control, increased revenues and profitability, value creation, ease in operations, accuracy, compliance, and competitive advantage. The hotel industry should aim to introduce innovative solutions and developing technologies such as: mobile technologies, IoT, AR and VR, data analytics, NLP, and robotics. Several infant technologies such as drones, AI and cognitive, and cyber technologies, could become state-of-the-art technology in the near future. Industry professionals must understand that digitalization in hospitality represents a significant value for management and ultimately for guests.

REFERENCES

1. Agarwal, M., Eloom, K., Mancini, M., & Patel, A. (2020). Industry 4.0: Reimagining manufacturing operations after COVID-19. McKinsey & Company. Retrieved from <https://www.mckinsey.com/business-functions/operations/our-insights/industry-40-reimagining-manufacturing-operations-after-covid-19>
2. Albawaba. (2018). UAE hospitality industry to reach \$7.6 billion by 2022. Albawaba Business. Retrieved from <https://www.albawaba.com/business/uae-hospitality-industry-reach-76-billion-2022-1164736>
3. Alcatel-Lucent. (2018). Hospitality digital transformation survey. Alcatel-Lucent, pp.3-8. Retrieved from <https://www.al-enterprise.com/-/media/assets/internet/documents/hospitality-survey-en.pdf>
4. Arlotta, C. (2018). Do asset managers play a role in revenue, profit generation? *Hotel Business*, 27(3), 30. Retrieved from <https://togo.hotelbusiness.com/article/asset-managers-play-role-revenue-profit-generation/>
5. Baghai, P., Bector, R., Cho, K., Dequesne, R., Erzan, O., Sudan, N., Thomas, K., & Weinberg, A. (2018). Achieving digital alpha in asset management. McKinsey & Company. Retrieved from <https://www.mckinsey.com/industries/financial-services/our-insights/achieving-digital-alpha-in-asset-management#>
6. Baig, A., Hall, B., Jenkins, P., Lammare, E., & McCarthy, B. (2020). The COVID-19 recovery will be digital: A plan for the first 90 days. McKinsey & Company. Retrieved from <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/the-covid-19-recovery-will-be-digital-a-plan-for-the-first-90-days>

7. Bhattacharjee, D., Seeley, J., & Seitzman, N. (2017). Advanced analytics in hospitality. McKinsey & Company. Retrieved from <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/advanced-analytics-in-hospitality>
8. Brandler, H. (2020). IHG Chief: Demand for hotels is currently at the lowest levels we've ever seen. *Business Traveller*. Retrieved from <https://www.businesstraveller.com/business-travel/2020/03/20/ihg-chief-demand-for-hotels-is-currently-at-the-lowest-levels-weve-ever-seen/>
9. Cimini, M. (2014). Healthy owner-manager relationships propel growth. *Lodging Magazine*. Retrieved from <https://lodgingmagazine.com/owner-manager-relationships/>
10. Cisco. (2020). What is cybersecurity? Cisco. Retrieved from <https://www.cisco.com/c/en/us/products/security/what-is-cybersecurity.html>
11. Cohn, P., Green, A., Langstaff, M., & Roller, M. (2017). Commercial drones are here. McKinsey & Company. Retrieved from <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/commercial-drones-are-here-the-future-of-unmanned-aerial-systems#>
12. Cornell University. (2016) Developing an asset management strategy. eCornell Online Certificate Course SHA613, Cornell University, New York. Retrieved from <https://ecornell.cornell.edu/courses/hospitality-and-foodservice-management/developing-an-asset-management-strategy/>
13. Costello, K. (2019). Gartner survey reveals Blockchain adoption combined with IoT adoption is booming in the U.S. Gartner. Retrieved from <https://gtmr.it/2DYMwm0>
14. Crandell, C. (2016). Hotel asset management 101: Choosing the right firm. Hotelnewsnow. Retrieved from <http://www.hotelnewsnow.com/articles/83659/Hotel-Asset-Management-101-Choosing-the-right-firm>
15. Crosby, M., Nachiappan, Pattanayak, P., Verma, S., & Kalyanaraman, V. (2016). Blockchain technology: Beyond bitcoin. *Applied Innovation Review*, 2, 6-10.
16. Dalton, J., & Liu, L. (2020). Seeing is believing. PricewaterhouseCoopers (PwC). Retrieved from <https://www.pwc.com/seeingisbelieving>
17. Davenport, T. H., & Westerman, G. (2018). Why so many high-profile digital transformations fail. *Harvard Business Review*. Retrieved from <https://hbr.org/2018/03/why-so-many-high-profile-digital-transformations-fail>
18. Davenport, T., Loucks, J., & Schatsky, D. (2017). Cognitive technology survey: Early adoption insight. Deloitte. Retrieved from <https://bit.ly/3aoFEdB>
19. Degryse C. (2016). Digitalisation of the economy and its impact on labour markets. European Trade Union Institute (ETUI). Retrieved from <https://www.etui.org/publications/working-papers/digitalisation-of-the-economy-and-its-impact-on-labour-markets>
20. Didion, I., Hernandez, P., Kaushik, A., & Masri, K. (2019). Operations management, reshaped by robotic automation. McKinsey & Company. Retrieved from <https://www.mckinsey.com/business-functions/operations/our-insights/operations-management-reshaped-by-robotic-automation#>
21. Eckert, V., Loop, P., & Berlin, B. (2017). The essential eight technologies. PricewaterhouseCoopers (PwC). Retrieved from <https://www.pwc.com/au/pdf/essential-8-emerging-technologies-augmented-and-virtual-reality.pdf>
22. Eggers, W., Malik, N., & Gracie, M. (2019). Using AI to unleash the power of unstructured government data. Deloitte. Retrieved from <https://www2.deloitte.com/us/en/insights/focus/cognitive-technologies/natural-language-processing-examples-in-government-data.html>
23. Frankenfield, J. (2020). How artificial intelligence works. Investopedia. Retrieved from <https://www.investopedia.com/terms/a/artificial-intelligence-ai.asp>
24. Gach, B., & Tobin, P. (2014). Digital Transformation. Accenture. Retrieved from https://www.accenture.com/t00010101t000000__w__/mx-

- es/_acnmedia/accenture/conversion-assets/nonsecureclients/documents/pdf/1/digital-transformation-asset-management.pdf
25. Gartner. (2021). Digitalization. Gartner. Retrieved from <https://www.gartner.com/it-glossary/digitalization/>
 26. Gavrilović, Z., & Maksimović, M. (2018). Green innovations in the tourism sector. *Strategic Management*, 23(1), 36-42.
 27. Geissbauer, R., Vedso, J., & Schrauf, S. (2016). A strategist's guide to Industry 4.0. *Strategy+Business*, Summer 2016(83). Retrieved from <https://www.strategy-business.com/article/A-Strategists-Guide-to-Industry-4.0>
 28. Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015a). Smart tourism: Foundations and developments. *Electronic Markets*, 25, 179–188.
 29. Gretzel, U., Werthner, H., Koo, C., & Lamsfus, C. (2015b). Conceptual foundations for understanding smart tourism ecosystems. *Computers in Human Behavior*, 50, 558–563.
 30. Gupta, M. (2017). *Blockchain for dummies. IBM limited edition*. John Wiley & Sons, Inc. Hoboken, NJ.
 31. Hansen, E.L., & Owen, R.M. (1995). Evolving technologies to drive competitive advantages in hospitality industry. *Hotel Online: Ideas and Trends*. Retrieved from <https://www.hotel-online.com>
 32. Hernandez, J., Conway, D., & Knight, T. (2018). *Tomorrow's Experience, Today*. KPMG Global Customer Experience Excellence Report, 12-14. Retrieved from <https://assets.kpmg/content/dam/kpmg/be/pdf/2018/06/tomorrows-experience-today-harnessing-a-customer-first-approach.pdf>
 33. Hospitality and Catering News. (2020). Marriott CEO Arne Sorenson on COVID-19. Hospitality and Catering News. Retrieved from <https://www.hospitalityandcateringnews.com/2020/03/video-marriott-ceo-arne-sorenson-on-covid-19-never-seen-anything-like-it-in-92-years/>
 34. HotelTechReport. (2019). Digital transformation in the hotel industry. HotelTechReport. Retrieved from <https://hoteltechreport.com/news/digital-transformation>
 35. Jackson, L. (2013). Towards an understanding of lodging asset management and its components. *Hospitality Review*, Florida International University 30(1/6), 92-110. Retrieved from <https://digitalcommons.fiu.edu/hospitalityreview/vo30/iss1/6>
 36. Jain, S. (2020). Can Blockchain accelerate Internet Of Things (Iot) adoption? Deloitte. Retrieved from <https://www2.deloitte.com/ch/en/pages/innovation/articles/blockchain-accelerate-iot-adoption.html#>
 37. Joshi, D. (2019). Drone technology uses and applications for commercial, industrial and military drones in 2020 and the future. [online] *Business Insider*. Retrieved from <https://www.businessinsider.com/drone-technology-uses-applications?IR=T>
 38. Kaufman, I., & Horton, C. (2015). *Digital Marketing*. New York, NY: Routledge.
 39. Khan, N., Rahul, A., & Lanawat, G. (2017). Toward an integrated technology operating model. McKinsey & Company. Retrieved from <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/toward-an-integrated-technology-operating-model#>
 40. Kutsenko, A. (2019). 7 ways to use AR/VR to improve guest engagement. [online] *Hospitality Technology*. Retrieved from <https://hospitalitytech.com/7-ways-use-arvr-improve-guest-engagement>
 41. Likens, S. (2020). The essential eight technologies. PricewaterhouseCoopers (PwC). Retrieved from <https://www.pwc.com/gx/en/issues/technology/essential-eight-technologies.html>
 42. MacNair, G.E. (2010). Strategic asset management (Real property). Aicanada. Retrieved from <https://www.aicanada.ca/article/strategic-asset-management-real-property/>
 43. Mansuri, S. (2017). How mobile technology is revolutionizing the travel industry. JustLuxe. Retrieved from <https://bit.ly/30MxqZu>

44. Marr, B. (2019). 5 amazing examples of natural language processing (NLP) in practice. *Forbes*. Retrieved from <https://www.forbes.com/sites/bernardmarr/2019/06/03/5-amazing-examples-of-natural-language-processing-nlp-in-practice/#70747c111b30>
45. Michels & Taylor. (2018). The role of a hotel asset manager. Michels & Taylor. Retrieved from <https://michelsandtaylor.com/news/2018/02/role-hotel-asset-manager/>
46. Nadkarni, S., Kriechbaumer, F., Rothenberger, M., & Christodoulidou, N. (2019). The path to the Hotel of Things: Internet of Things and Big Data converging in hospitality. *Journal of Hospitality and Tourism Technology*, 11(1), 93-107.
47. Paul, O. (2018). Revenue acceleration for digital leaders. KPMG. Retrieved from <https://home.kpmg/be/en/home/insights/2018/10/revenue-acceleration-for-digital-leaders.html>
48. Puschmann, T. (2017). Fintech. *Business & Information Systems Engineering*, 59 (1), 69–76.
49. PwC. (2017). Asset & wealth management revolution: Embracing exponential change. PricewaterhouseCoopers (PwC). Retrieved from <https://www.pwc.com/gx/en/industries/financial-services/asset-management/publications/asset-wealth-management-revolution.html>
50. Rangasamy, S., Nadenichek, R., Rayasam, M., & Sozdatelev, A. (2018). Natural language processing in healthcare. McKinsey & Company. Retrieved from <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/natural-language-processing-in-healthcare#>
51. Ranger, S. (2020). What is the IoT? Everything you need to know about The Internet Of Things right now. ZDNet. Retrieved from <https://www.zdnet.com/article/what-is-the-internet-of-things-everything-you-need-to-know-about-the-iot-right-now/>
52. Revon, D. (2020). Asset Services. Cushman & Wakefield. Retrieved from <https://www.cushmanwakefield.com/en/france/services/asset-services>
53. SAS. (2020). Big Data Analytics - What It Is And Why It Matters. SAS. Retrieved from https://www.sas.com/en_us/insights/analytics/big-data-analytics.html
54. Scardina, B. (2020). Tenant Representation - Retail. Cushman & Wakefield. Retrieved from <https://www.cushmanwakefield.com/en/united-states/services/tenant-representation-retail>
55. Schementi, G. (2020). Tenant Representation. Cushman & Wakefield. Retrieved from <https://www.cushmanwakefield.com/en/united-states/services/tenant-representation>
56. Sciant. (2020). Machine learning: The future of travel and hospitality. Sciant. Retrieved from <https://medium.com/sciant/machine-learning-the-future-of-travel-and-hospitality-61958337657c>
57. Shukla, C. (2019). Hospitality going digital. PricewaterhouseCoopers (PwC). Retrieved from <https://www.ahic.com/sessions/2019/Chimnay-Shukla-PwC-Digital-in-hospitality.pdf>
58. Singh, A., Kline, R., Ma, Q., & Beals, P. (2012). Evolution of hotel asset management: The historical context and current profile. *Cornell Hospitality Quarterly*, 53(4), 326-338.
59. Slors, A. (2020). Hotel asset management during a crisis. Duettocloud. Retrieved from <https://www.duettocloud.com/library/hotel-asset-management-during-a-crisis>
60. Statista. (2020). U.S. digital platform online time by age 2019. Statista. Retrieved from <https://www.statista.com/statistics/444940/us-digital-platform-audiences-age-distribution/>
61. The IAM. (2015). Asset management – an anatomy. The Institute of Asset Management. Retrieved from https://theiam.org/media/1781/iam_anatomy_ver3_web.pdf
62. Tilson, D., Lyytinen, K., & Sørensen, C. (2010). Digital infrastructures: The missing IS research agenda. *Information Systems Research*, 21(4), 748-759.
63. Torres, A. (2018). Using a smartphone application as a digital key for hotel guest room and its other app features. *International Journal of Advanced Science and Technology*, 113, 103-112.

64. Weisbaum, H. (2017). Is the cloud the new target for ransomware hackers? NBC News. Retrieved from <https://www.nbcnews.com/tech/security/ransomware-now-billion-dollar-year-crime-growing-n704646>
65. Williams, C., & Levitt, R. (2019). The impact of technology on hotel sales and marketing. HVS. Retrieved from <https://www.hvs.com/article/8547-the-impact-of-technology-on-hotel-sales-and-marketing>
66. Yoo, Y., Lyytinen, K., Boland, R., Berente, N., Gaskin, J., Schutz, D., & Srinivasan, N. (2010). The next wave of digital innovation: Opportunities and challenges. *Digital Challenges in Innovation Research*. 2010(1), 1-37.

Table 1. Summary of Results

Question	Emerged Themes	Quotes
1. As an asset manager, how do you think introducing digital aspects will positively impact hospitality asset management?	<ul style="list-style-type: none"> • Positive impact • Improve customer satisfaction • Greater effectiveness in making timely and smarter decisions 	<p><i>“What is key for us is that we digitalize guest experience especially before and after the stay”</i></p> <p><i>“Digitalization is the ability to increase data you have, which then allows you to do a number of things effectively”</i></p> <p><i>“Now is the right time for the hospitality industry to see this value and make the move to digitalization”</i></p>
2. How do you see digitalization in hospitality asset management as a value creation aspect?	<ul style="list-style-type: none"> • Produce greater customer satisfaction • Emphasis on cost savings • Data collected with digital tools would create value for asset management and hotel operations 	<p><i>“Based on all the data analytics can be performed and then you can make the guests future stays more memorable”</i></p> <p><i>“Guests who find this digitalization are very highly likely to come back or refer back to friends as I have seen in our experience.”</i></p> <p><i>“Digitalization ultimately will create a better Net Operating Profit, and therefore also a better value from asset perspective.”</i></p>
3. As Millennials will form a large portion of travelers, how do you think mobile technologies will have a significant impact on the hospitality industry?	<ul style="list-style-type: none"> • Use mobile-related technology for the majority of the hotel’s services 	<p><i>“It could be that 70-75% of bookings or even more are made through mobile technology through a smartphone.”</i></p> <p><i>“The millennials would love to book a room from a mobile or mobile app, love to check-in before they even come to the hotel, or check-out without passing by the reception to avoid queues.”</i></p>
4. What do you think the role of robotics in the hospitality industry over the next five years?	<ul style="list-style-type: none"> • The next 5 years will be very important for the boost of robotics technology 	<p><i>“In the next 5 years down the line, I would see more on the back of the house but not much in front of the house.”</i></p>
5. To what extent do you think technology (such as IoT, NLP, and Blockchain) can play a role in improving service quality?	<ul style="list-style-type: none"> • Implementation of such technologies will increase guest satisfaction levels. 	<p><i>“This is all related to improving the service delivery in our hotels.”</i></p> <p><i>“If these technologies are implemented correctly, they will</i></p>

Question	Emerged Themes	Quotes
		<i>result in enhanced guest experience."</i>
6. A significant shift to digital strategies was noticed in almost every hotel chain during the pandemic. How do you think adapting digitalization earlier would have helped improve hotel operations?	<ul style="list-style-type: none"> The pandemic has played a significant role in the quick rollout of hospitality digital technology due to social distancing, hygiene, and other reasons. 	<p><i>"I am surprised that we have all been digitalized six times the normal speed because of Covid."</i></p> <p><i>"Covid actually has accelerated the technology adoption in our hotel industry."</i></p>
7. How should hotels updated their technologies?	<ul style="list-style-type: none"> Timely adoption and upgrading are mandatory in order to gain a competitive advantage in the market. 	<i>"Unfortunately technology has a very limited lifespan so in 6-12 months we need to catch up with the technology."</i>
8. Do you think hotel industry management is utilizing hotel data appropriately to create future digital strategies?	<ul style="list-style-type: none"> Hotels are not using data appropriately. 	<i>"I don't see that hotels are really optimizing and thinking about the y data they have; they just have the data but they don't know what to do with it."</i>
9. What could be the cost impact with and without digitalization in asset management.	<ul style="list-style-type: none"> Non-digitalization could be very costly to a business and ultimately may result in losing that business. 	<i>"We increased the net promoter score (NPS) 25% in 6 years and we are also increasing productivity and quality further. I would credit much of that of our use of data to help us to rapidly improve."</i>
10. How important is planning of a digital path and implementing the technology in hotels?	<ul style="list-style-type: none"> Planning is an aspect of digital planning. Digital path planning bears significant importance towards success in the hospitality industry. 	<i>"When you start talking about the digital path, it feels like it is a very simple, easy, and fast process to achieve, but the truth is just opposite...it is a demanding process."</i>
11. Do you think that guest experience, from booking to check-out, should be completely digital , high-tech-low touch? And in what way it should be digital?"	<ul style="list-style-type: none"> It needs to be a complete digital end-to-end solution. Continuous involvement of hotel staff is also required. 	<p><i>"Higher guest satisfaction can be achieved through the technology of the future."</i></p> <p><i>"Hotels should still have a little bit of a human touch, but to a very limited extent."</i></p>