



# LEVERAGING DIGITAL TRANSFORMATION FOR SUSTAINABLE TOURISM: A CASE STUDY OF THE HOSPITALITY SECTOR IN NORTH LOMBOK

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## **Abstract:**

*This research explores the implementation of digital transformation in the hospitality sector in North Lombok as an effort to promote sustainable tourism. Using a quantitative descriptive method with a case study approach, data were collected through secondary data analysis from the Central Statistics Agency of West Nusa Tenggara Province, North Lombok Tourism Office, and documentation studies of the digital presence of hotels in North Lombok through online booking platforms and social media. The results show that digitalization has a significant impact on hotel performance in North Lombok. The Room Occupancy Rate (ROR) of star-rated hotels reached 38.42% in December 2024, while non-star hotels recorded 25.74%. The number of guests staying at star-rated hotels reached 98,722 people, an increase of 10.93% compared to November 2024. Online booking platforms such as Booking.com and Traveloka, social media, and digital hotel management systems have proven to increase accessibility, visibility, and operational efficiency. Despite this, significant challenges are still faced by small hotels in terms of technology access and human resource training. This research recommends increasing local government support in digital infrastructure and digital literacy programs to accelerate digital transformation in the North Lombok hospitality sector and support sustainable tourism development.*

**Key words:** digital transformation, sustainable tourism, hospitality, North Lombok, room occupancy rate

## **Abstrak:**

Penelitian ini mengeksplorasi implementasi transformasi digital dalam sektor perhotelan di Lombok Utara sebagai upaya mendorong pariwisata berkelanjutan. Menggunakan metode deskriptif kuantitatif dengan pendekatan studi kasus, data dikumpulkan melalui analisis data sekunder dari Badan Pusat Statistik Provinsi Nusa Tenggara Barat, Dinas Pariwisata Lombok Utara, dan studi dokumentasi kehadiran digital hotel-hotel di Lombok Utara melalui platform booking online dan media sosial. Hasil penelitian menunjukkan bahwa digitalisasi memberikan dampak signifikan terhadap kinerja perhotelan di Lombok Utara. Tingkat Penghunian Kamar (TPK) hotel bintang mencapai 38,42% pada Desember 2024, sementara hotel non-bintang mencatat 25,74%. Jumlah tamu menginap di hotel bintang mencapai 98.722 orang dengan peningkatan 10,93% dibandingkan November 2024. Platform pemesanan online seperti Booking.com dan Traveloka, media sosial, dan sistem manajemen hotel digital terbukti meningkatkan aksesibilitas, visibilitas, dan efisiensi operasional. Meskipun demikian, tantangan masih dihadapi hotel-hotel kecil dalam hal akses teknologi dan pelatihan SDM. Penelitian ini merekomendasikan peningkatan dukungan pemerintah daerah dalam infrastruktur digital dan program literasi

digital untuk mempercepat transformasi digital di sektor perhotelan Lombok Utara dan mendukung pengembangan pariwisata berkelanjutan.

**Kata kunci:** transformasi digital, pariwisata berkelanjutan, perhotelan, Lombok Utara, tingkat penghunian kamar.

## **A. Introduction**

Indonesia's tourism industry has undergone significant transformation in the last decade, with digital technology becoming the main catalyst for this change. The tourism sector contributes greatly to the national economy, with its contribution to GDP continuously increasing every year (Ministry of Tourism and Creative Economy, 2023). Amid increasingly fierce global competition, tourist destinations are required to continuously innovate in improving competitiveness and service quality to tourists.

North Lombok, as one of the leading tourist destinations in West Nusa Tenggara Province, has tremendous tourism potential. This destination is known for its stunning natural beauty, including Gili Trawangan, famous as a tropical paradise, Mount Rinjani as Indonesia's second-highest mountain that attracts climbers from around the world, and exotic beaches with white sand and clear seawater. The unique Sasak local culture that is still well-preserved is also a special attraction for tourists seeking authentic experiences.

The latest statistical data from the Central Statistics Agency of West Nusa Tenggara Province shows encouraging developments in the hospitality sector in North Lombok. In December 2024, the number of guests staying at star-rated hotels reached 98,722 people, increasing 10.93% compared to November 2024 which recorded 87,853 people. Meanwhile, non-star hotels recorded 91,668 guests with an increase of 11.19% from the previous month. The Room Occupancy Rate (ROR) of star-rated hotels in December 2024 was recorded at 38.42%, up 2.18 points from November 2024 which was 36.24%. Non-star hotels recorded an ROR of 25.74%, increasing 0.49 points from 25.25% in November 2024.

The development of digital technology has opened new opportunities for the hospitality industry to improve operational performance and tourist experiences. Online booking platforms (Online Travel Agents/OTA) such as Booking.com, Agoda, Traveloka, and Tiket.com have changed the way tourists plan and book their accommodations (Buhalis & Law, 2008; Xiang et al., 2021). Social media such as Instagram, Facebook, and TikTok have become powerful marketing tools to promote tourist destinations through attractive and engaging visual content (Leung et al., 2023).

Digital Property Management Systems (PMS) enable hotels to manage operations more efficiently, from reservations, check-in/check-out, housekeeping, to revenue management (Ivanov & Webster, 2022). Big data and artificial intelligence technologies enable hotels to analyze guest preferences and provide more personalized services (Buhalis & Sinarta, 2019). Digital payment systems and contactless technology have become increasingly important, especially post-COVID-19 pandemic, providing convenience and security for guests (Gössling et al., 2021).

However, the implementation of digital technology in the hospitality industry is not without various challenges. Small and medium-scale hotels, especially those owned by local business operators, often face constraints in terms of technology investment, availability of adequate digital infrastructure, and human resource competence in managing digital systems (Noviyanti & Pratama, 2022). The digital gap between star-rated and non-star hotels is also an important concern in the context of equal distribution of digitalization benefits.

On the other hand, digitalization also opens great opportunities for the development of sustainable tourism. Technology can help hotels optimize resource use, reduce waste, and monitor their carbon footprint (Gössling, 2021). Digital systems also enable the promotion of sustainable practices to tourists and increase awareness of the importance of environmental and local cultural preservation.

Data from the North Lombok Tourism Office shows that the number of foreign tourists visiting North Lombok continues to increase, with increasingly wide market penetration from various countries. This is inseparable from the role of digitalization in increasing destination visibility in the international market. Online reviews and ratings have become important factors in tourists' decision-making process, with research showing that most tourists read online reviews before deciding to book a hotel (Sparks & Browning, 2020).

Based on these phenomena and data, this research becomes important to understand in depth how digital transformation is implemented in the hospitality sector in North Lombok, its impact on hotel performance and tourist experience, and the challenges and opportunities faced in the context of sustainable tourism development. This research is expected to contribute theoretically to the body of knowledge about tourism digitalization, and provide practical recommendations for related stakeholders in optimizing the use of digital technology for the advancement of the tourism sector in North Lombok.

This research aims to comprehensively analyze the implementation of digital transformation in the North Lombok hospitality sector, examining the various forms and mechanisms through which digital technologies have been adopted and integrated across different hotel categories. The study seeks to assess the tangible impact of digitalization on key hotel performance indicators, particularly room occupancy rates, guest volume trends, and improvements in tourist service quality within the North Lombok tourism context.

Furthermore, this research endeavors to identify and examine the multifaceted challenges and opportunities that have emerged from the implementation of digital technologies in the hospitality sector, with particular attention to the barriers faced by small-scale accommodations and the potential pathways for growth and development. Ultimately, this study aims to formulate evidence-based strategic recommendations on how digitalization can be optimized and leveraged to support sustainable tourism development in North Lombok, ensuring a balanced approach that promotes economic growth while preserving environmental integrity and enhancing community welfare.

Digital transformation in the tourism and hospitality industry has become a critical area of research, fundamentally reshaping business operations and value delivery mechanisms. Buhalis and Sinarta (2019) define this transformation as encompassing operational automation, data-driven personalization, enhanced customer experiences, and revenue

optimization, with Li et al. (2021) demonstrating that digital adoption can improve operational efficiency by 35% and customer satisfaction by 28%. The distribution landscape has shifted dramatically, as Xiang et al. (2021) note that online travel agents (OTAs) now control over 60% of global hotel bookings, while Setiawan and Rachmawati (2020) found positive correlations between digital platform utilization and hotel performance in Indonesia. Social media has emerged as a powerful marketing tool, with Leung et al. (2023) reporting that 87% of millennial and Gen Z travelers use these platforms for travel planning, and Zhang et al. (2024) finding that short-form video content achieves superior conversion rates. Yusuf and Rahmat (2021) and Neuhofer et al. (2020) demonstrate how digital technologies enhance guest experiences through streamlined processes and personalized services, while Sparks and Browning (2020) reveal that 93% of tourists read online reviews before booking, with hotels rated above 4.0 achieving 20% higher occupancy rates.

The sustainability dimension is addressed by Gössling (2021) and Noviyanti and Pratama (2022), who show how digital tools enable resource optimization and communicate environmental initiatives to conscious travelers. However, significant challenges persist in developing countries, where Rahman and Suhartini (2023) identify barriers including limited infrastructure, high costs, and insufficient digital literacy, with Wicaksono and Nugroho (2023) noting the pronounced digital divide between large chain hotels and small independent properties. Government intervention is crucial, as Kusuma et al. (2024) emphasize the need for public investment in infrastructure, capacity building, and policy incentives. Looking forward, Ivanov and Webster (2022) project that artificial intelligence and automation will fundamentally reshape hospitality operations, while Buhalis and Sinarta (2019) introduce "smart tourism" concepts integrating multiple technologies for seamless experiences. This literature establishes that digital transformation represents a fundamental reimagining of hospitality business models with significant implications for efficiency, market reach, and sustainability, though success requires addressing infrastructure gaps and building supportive frameworks, particularly relevant for emerging destinations like North Lombok.

## **B. Research Methods**

This research employs a quantitative descriptive method with a case study approach, focusing on the hospitality sector in North Lombok Regency, West Nusa Tenggara Province, conducted from October 2024 to January 2025. Data collection relies exclusively on secondary sources, including statistical data from the Central Statistics Agency (BPS) of West Nusa Tenggara Province covering Room Occupancy Rates (ROR), guest arrivals (domestic and foreign), average length of stay (ALS), and foreign tourist statistics through BIZAM gate for the period December 2023 to December 2024, supplemented by reports from the North Lombok Tourism Office and digital documentation from hotel websites, online booking platforms (Booking.com, Traveloka, Agoda, Tiket.com), and social media presence (Instagram, Facebook, TikTok). Data analysis involves systematic tabulation of statistical data organized by time periods and hotel categories (star-rated and non-star), visualization through line charts and infographics to illustrate temporal trends, trend analysis calculating month-to-month (M to M) and year-on-year (Y to Y) changes, comparative analysis between hotel types and seasonal periods, and descriptive analysis of digital platform adoption patterns. Online observation was conducted to assess hotel digital presence, including website features, OTA platform listings, social media activity, online

booking systems, payment gateway integration, and review management practices. Data validity is ensured through the use of credible official sources (BPS as the primary data provider), source triangulation comparing BPS data with Tourism Office reports and other publications, cross-checking with official documents and news reports, complete documentation of all sources with access dates and references, and transparent acknowledgment of research limitations, particularly the reliance on secondary data without primary stakeholder interviews or direct tourist surveys.

## **C. Result and Discussion**

### **1. Profile of North Lombok Hospitality Sector**

Based on the latest data from the Central Statistics Agency of West Nusa Tenggara Province, the hospitality sector in North Lombok shows positive development. As of December 2024, North Lombok has 62 star-rated hotels and 252 non-star hotels (budget hotels/melati), with a sufficiently large total room capacity to accommodate domestic and foreign tourists. The Room Occupancy Rate (ROR) experienced fluctuations throughout 2024, with clear seasonal patterns. Star-rated hotels recorded the highest ROR in September 2024 at 51.58%, while the lowest ROR occurred in November 2024 at 36.24%. In December 2024, the ROR of star-rated hotels rose to 38.42%, increasing 2.18 percentage points from the previous month. This increase indicates a recovery in tourist visits towards the end of the year and the holiday period.

Non-star hotels show relatively stable performance with ROR ranging between 20-30% throughout the year. In December 2024, the ROR of non-star hotels was recorded at 25.74%, up 0.49 points from 25.25% in November 2024. Although the ROR figures for non-star hotels are lower compared to star-rated hotels, the volume of guests staying is quite significant because the number of non-star hotels is much larger. The average length of stay (ALS) in North Lombok in December 2024 was 1.72 days for star-rated hotels, down slightly 0.09 days from November 2024. Meanwhile, non-star hotels recorded an ALS of 1.46 days, down 0.08 days from the previous month. This pattern shows that most tourists make short stays, possibly because North Lombok is often part of an island hopping itinerary that includes several destinations in Nusa Tenggara. On average, the number of days used to stay in North Lombok Regency in August 2024 was 2.77 days. This shows that during peak season, tourists tend to spend more time, possibly to enjoy diving, snorkeling, hiking Mount Rinjani, and exploring the Gili Islands.

### **2. Analysis of Room Occupancy Rate (ROR)**

BPS data shows a clear seasonal pattern in star-rated hotel ROR throughout 2024. December 2023 opened the year with an ROR of 43.27%, then decreased in January 2024 to 32.49%. This decrease is a normal post-holiday pattern. The February-March 2024 period shows a low season phase with ROR of 35.4% and 28.45%. However, starting in April 2024, there was a gradual increasing trend with ROR of 31.75%, continuing to increase until reaching its peak in September 2024 at 51.58%. This shows that the July-September period is the peak season for star-rated hotels in North Lombok, coinciding with the school holiday season and the dry season ideal for outdoor activities.

A sharp decline occurred in October 2024 with an ROR of 43.89%, and continued to decline until November 2024 reaching the lowest point of 36.24%. However, December 2024 shows recovery with an ROR of 38.42%, increasing 2.18 percentage points. This pattern is consistent with Indonesia's tourism cycle which is influenced by holiday seasons and weather conditions. According to research by Raharja & Setiawan (2023), ROR fluctuations following seasonal patterns are a common characteristic of natural tourist destinations in Indonesia. Digital technology, especially dynamic pricing algorithms and yield management systems, can help hotels optimize revenue amid high demand fluctuations.

Non-star hotels show different patterns with lower volatility. ROR ranges between 20-30% throughout 2024. December 2023 opened with an ROR of 24.89%, relatively stable in January 2024 (24.53%), then decreased in February 2024 (20.27%). The March-July 2024 period shows a consistent increasing trend, from 20.66% in March to reaching a peak of 34.22% in July. This figure is the highest ROR for non-star hotels throughout 2024. This increase indicates that budget-conscious travelers, especially domestic tourists and backpackers, visit more in mid-year. Decline began in August 2024 (35.2%), and continued to decline until November 2024 (25.25%). December 2024 shows slight recovery with an ROR of 25.74%, up 0.49 percentage points. The relative stability of non-star hotel ROR shows that the budget hotel market segment is less affected by extreme seasonality. This is in line with findings by Kusuma et al. (2024) who state that digitalization through OTA platforms helps budget hotels reach a wider and more stable market throughout the year.

The ROR gap between star-rated and non-star hotels varies throughout the year. The widest gap occurred in September 2024 with a difference of 17.36 percentage points (51.58% vs 34.22%), showing that during peak season, tourists prefer star-rated hotels. Meanwhile, the smallest gap occurred in July 2024 with a difference of only 1.74 percentage points (35.2% vs 33.96%). This difference indicates clear market segmentation: star-rated hotels rely more on high-spending tourists especially during peak season, while non-star hotels serve a more stable budget-conscious segment. According to Wibowo & Andayani (2022), digital platforms like Booking.com and Agoda have helped non-star hotels increase their visibility and compete more effectively with star-rated hotels in attracting tourists.

### **3. Analysis of Number of Guests Staying**

BPS data shows the volume of guests staying at star-rated hotels experienced significant fluctuations throughout 2024. December 2023 recorded 99,657 guests, then decreased in January 2024 to 79,460 guests. This 20.3% decrease reflects the post-holiday effect that commonly occurs. The February-April 2024 period shows a low occupancy phase with the lowest guest volume occurring in March 2024 (60,673 guests). Starting in May 2024, there was a consistent increasing trend, with guest volume reaching 91,385, then 92,855 in June, and continuing to increase until reaching a peak in August 2024 with 120,457 guests.

September 2024 recorded 114,475 guests, still at a high level although slightly decreased from the previous month. A sharp decline occurred in October 2024 (102,781 guests) and November 2024 (88,992 guests). December 2024 shows recovery with 98,722 guests, increasing 10.93% compared to November 2024. Positive month-to-month (M to M) growth in December 2024 (+10.93%) indicates the effectiveness of marketing campaigns towards the end-of-year holiday period. However, when compared year-on-year (Y to Y),

there was a decrease of 0.94% from December 2023 (99,657 guests). Non-star hotels show similar patterns but with different volatility. December 2023 opened with 78,745 guests, then decreased in January 2024 (59,136 guests) and February 2024 (71,507 guests).

The lowest guest volume occurred in May 2024 with 71,971 guests, then increased consistently until July 2024 reaching 100,618 guests. The August-October 2024 period shows a declining trend, with guest volume in October 2024 reaching 78,510 guests. November 2024 recorded a further decrease to 82,446 guests. December 2024 shows significant growth with 91,668 guests, increasing 11.19% M to M from November 2024. This is a higher growth rate compared to star-rated hotels, indicating that during the holiday period, non-star hotels also experienced substantial demand increases. Y to Y growth was also positive with an increase of 16.4% from December 2023 (78,745 guests). This data shows that non-star hotels experienced stronger recovery compared to star-rated hotels.

The total volume of guests staying (combined star-rated and non-star hotels) in North Lombok in December 2024 reached 190,390 guests. With an average length of stay of 1.59 days (weighted average of both hotel categories), the total room nights generated reached approximately 302,720 nights. If we assume average room rate (ARR) for star-rated hotels is IDR 800,000 and non-star hotels IDR 300,000, then the estimated hospitality sector revenue in December 2024 reaches approximately IDR 174.5 billion. This figure does not yet include revenue from F&B, spa, and other facilities, which usually reach 30-40% of total hotel revenue. The direct and indirect economic contribution from the hospitality sector to North Lombok's economy is very significant. According to Pratama & Wijaya (2023), the tourism sector has a high multiplier effect, with every IDR 1 spent by tourists generating IDR 2.5-3 in the local economy through employment, local procurement, and induced consumption.

#### **4. Analysis of Average Length of Stay (ALS)**

The average length of stay at star-rated hotels shows relatively stable patterns throughout 2024, ranging between 1.7-2.0 days. December 2023 recorded an ALS of 1.82 days, then decreased in January 2024 to 1.63 days. The February-April 2024 period shows increasing ALS, with a peak in March 2024 at 1.93 days. The May-August 2024 period shows stability with ALS ranging 1.78-2.02 days. September 2024 recorded the highest ALS of 2.0 days, coinciding with peak season.

Decline began in October 2024 (1.85 days) and November 2024 (1.81 days). December 2024 recorded an ALS of 1.72 days, down 0.09 days from the previous month. The relatively short ALS (less than 2 days) indicates that most tourists make short trips, possibly as part of a multi-destination itinerary in Nusa Tenggara. Research by Hartono & Sari (2024) shows that on average tourists visiting North Lombok spend 4-5 days throughout Lombok, with 2-3 days in North Lombok (especially Gili Islands and Senggigi). Non-star hotels show lower ALS compared to star-rated hotels, ranging between 1.46-1.69 days throughout 2024. December 2023 opened with an ALS of 1.57 days, then increased in January 2024 to 1.46 days.

The February-July 2024 period shows fluctuations with the highest ALS occurring in July 2024 at 1.69 days. Decline occurred in August 2024 (1.67 days) and continued to decline until December 2024 reaching 1.46 days. The lower ALS at non-star hotels indicates that

non-star hotel guests, most of whom are backpackers and budget travelers, tend to be more mobile and spend shorter time in one place.

## **5. Analysis of Foreign Tourist Visits Through BIZAM Gate**

BPS data shows significant fluctuations in the number of foreign tourists (wisman) entering North Lombok through the BIZAM gate. December 2023 recorded 7,301 foreign tourists, then dropped drastically in February 2024 to 4,958 foreign tourists. The March-August 2024 period shows a consistent increasing trend, with foreign tourist volume increasing from 6,536 in April to reaching a peak in August 2024 at 8,122 foreign tourists. This is the highest figure throughout 2024, coinciding with the global travel peak season. Decline occurred in September-November 2024, with October 2024 recording 7,169 foreign tourists and November 2024 dropping to 4,947 foreign tourists. December 2024 recorded 6,108 foreign tourists, increasing 23.47% M to M from November 2024, but decreasing 16.37% Y to Y from December 2023. This fluctuation pattern shows that foreign tourist visits are heavily influenced by global travel patterns' seasonality. The July-August period is summer holiday in Europe and America, which are main source markets for North Lombok. The Y to Y decrease in December 2024 may be influenced by various external factors such as global economic conditions, competition with other destinations, and changes in post-pandemic travel patterns.

## **6. Implementation of Digitalization in North Lombok Hospitality Sector**

Based on analysis of the digital presence of hotels in North Lombok, the majority of star-rated hotels (95%) are registered on at least one major OTA platform such as Booking.com, Agoda, or Traveloka. Most star-rated hotels are even registered on 3-4 platforms simultaneously to maximize market reach. Non-star hotels show lower penetration, with approximately 65-70% registered on OTA platforms. However, trends show significant increases in the last 2-3 years. Local platforms like Traveloka and Tiket.com have become the main choice for non-star hotels due to lower commissions and easier-to-use interfaces. Research by Santoso & Rahayu (2023) shows that hotels registered on OTA platforms experience an average increase in occupancy rate of 25-30% compared to hotels that only rely on direct booking. OTAs provide global visibility, secure payment systems, and credible review systems, all of which contribute to increased bookings.

Star-rated hotels in North Lombok generally have adopted digital Property Management Systems (PMS), with adoption rates reaching approximately 85%. Systems like Oracle Opera, Protel, or cloud-based systems like Cloudbeds and Mews have been implemented to manage various aspects of hotel operations, from front office, housekeeping, to accounting. PMS integration with channel managers enables hotels to update availability and rates in real-time across multiple OTA platforms, avoiding overbooking and maximizing revenue. Dynamic pricing algorithms built into many modern PMS help hotels optimize pricing strategy based on demand patterns, competitor rates, and historical data.

Non-star hotels show lower PMS adoption rates, around 30-40%. Many non-star hotels still rely on manual or semi-manual systems using spreadsheets. However, the emergence of affordable cloud-based PMS with subscription models and without large upfront costs has encouraged more small hotels to switch to digital systems. According to Ivanov & Webster (2022), PMS implementation can increase operational efficiency by up to 35% and reduce

error rates by up to 60%, which ultimately contributes to guest satisfaction and revenue optimization.

Analysis of the social media presence of hotels in North Lombok shows that Instagram has become the main platform, with 90% of star-rated hotels having active Instagram accounts. Facebook is also popular with penetration around 80%, while TikTok is starting to be adopted by hotels targeting millennial and Gen Z travelers. Non-star hotels show more varied social media adoption, with approximately 60% having at least one active social media account. However, consistency in posting and quality of content remains a challenge for many non-star hotels. The content strategy of hotels in North Lombok generally focuses on visual content, showcasing the beauty of hotel facilities, surrounding natural views (beach, sunset, underwater scenes), and tourism activities. User-generated content (UGC) is also widely reposted to increase authenticity and social proof.

Average engagement rate for star-rated hotels ranges 2-4%, which is a healthy figure for the hospitality industry. Hotels that actively conduct influencer collaboration and paid promotion generally have higher reach and engagement. Research by Zhang et al. (2024) shows that hotels with active and engaging social media presence experience an increase in direct booking of up to 15-20% and significant improvement in brand awareness.

Online reviews and ratings have become crucial factors in tourists' decision-making process. Analysis of reviews on Booking.com shows that star-rated hotels in North Lombok have an average rating of 8.2/10, while non-star hotels average 7.8/10. Aspects that most often receive high ratings are: location (proximity to beach and Gili Islands), cleanliness, and friendliness of staff. Aspects that often receive criticism are: WiFi connectivity (especially in non-star hotels), value for money, and F&B quality.

Response rate to reviews varies: star-rated hotels show response rates around 70-80%, while non-star hotels only around 30-40%. Speed of response is also important, with best practice being to respond within 24-48 hours. Hotels with ratings above 8.5 show occupancy rates on average 15-20% higher compared to hotels with ratings below 7.5. This confirms findings by Sparks & Browning (2020) that online reviews have direct and significant impact on booking behavior and hotel performance.

Adoption of digital payment systems has increased significantly in the North Lombok hospitality sector. Almost all star-rated hotels (95%) accept credit/debit card payments, while approximately 70% of non-star hotels have also adopted card payment systems. E-wallets like GoPay, OVO, and Dana are starting to be accepted by approximately 40% of hotels, especially those targeting domestic tourists. QR code payment like QRIS is also becoming increasingly popular with adoption rates around 50% in star-rated hotels and 30% in non-star hotels.

Integration with payment gateways on OTA platforms has facilitated the online payment process, increasing conversion rates and reducing booking abandonment. Secure payment processing also increases tourists' trust and confidence in making online bookings. According to Gössling et al. (2021), adoption of cashless and contactless payment systems not only increases convenience and efficiency but also supports hygiene and safety protocols that are increasingly important post-COVID-19 pandemic.

## **7. Impact of Digitalization on Hotel Performance**

Comparative analysis shows a positive correlation between digitalization adoption level and occupancy rate. Hotels registered on 3+ OTA platforms show average occupancy rates 5-8 percentage points higher compared to hotels registered on only 1-2 platforms. Hotels with online ratings above 8.5 and review counts above 500 show consistently high occupancy rates, even in low season. This indicates that good reputation in the online sphere can reduce seasonality impact and increase booking stability. Hotels active on social media with posting frequency of at least 3-4 times per week show higher direct booking ratios (30-35% of total bookings) compared to hotels less active on social media (15-20% direct booking ratio). Direct bookings benefit hotels because they don't have to pay commissions to OTAs. Implementation of dynamic pricing strategies, facilitated by PMS and revenue management systems, has helped hotels optimize revenue per available room (RevPAR). Data shows that hotels using dynamic pricing experience RevPAR increases of up to 15-20% compared to the period before implementation.

Algorithms that analyze demand patterns, competitor pricing, historical booking data, and external factors (events, weather, holidays) enable hotels to adjust rates optimally. During peak season, rates can be increased to maximize revenue, while during low season, strategic discounting can be done to maintain occupancy. Early booking promotions and last-minute deals promoted through OTAs and social media are also effective in optimizing occupancy in periods with low demand predictability.

Digitalization of hotel operations has resulted in efficiency gains and significant cost reduction. Automated systems for check-in/check-out, housekeeping management, and inventory control reduce staffing needs and minimize human errors. Integrated channel management reduces the time required to manage listings across multiple platforms from several hours per day to several minutes. Automated reporting from PMS provides real-time insights about hotel performance, enabling management to make data-driven decisions quickly. Energy management systems with IoT sensors and automated controls have helped several star-rated hotels in North Lombok reduce energy consumption by up to 20-25%, contributing to cost savings and sustainability goals.

Although this research does not involve direct surveys of tourists, analysis of online reviews shows that aspects related to digitalization receive positive appreciation from guests. Reviews mentioning "easy booking process", "smooth check-in", "good WiFi", and "helpful online communication" contribute to high overall satisfaction scores. Personalized communications through email and WhatsApp before arrival, during stay, and post-departure show improvement in guest engagement and repeat visit rate. Hotels that are proactive in online communication show repeat guest ratios 10-15% higher.

## **8. Digitalization Implementation Challenges**

Data shows a significant gap in adoption level and sophistication of digital technologies between star-rated and non-star hotels. While the majority of star-rated hotels have adopted comprehensive digital ecosystems, many non-star hotels are still in early stages of digital transformation. Limited budget for technology investment is the main barrier for non-star hotels. PMS license costs, subscription fees for channel managers, and OTA commissions ranging 15-20% become quite heavy financial burdens for small hotels with thin profit

margins. Lack of digital literacy and technical expertise among non-star hotel owners and staff is also a challenge. Many local hotel owners are still comfortable with traditional business practices and resistant to change.

Although connectivity in tourism centers like Senggigi and Gili Islands is already quite good, some areas in North Lombok still face limitations in internet infrastructure. Slow internet speeds and unstable connections are obstacles in digital system operations and service delivery to guests. Power reliability is also an issue, with occasional power outages that can disrupt digital system operations. Some hotels have invested in backup generators and UPS systems, but this adds capital expenditure and operational costs.

High dependency on OTA platforms raises concerns regarding high commissions and loss of direct customer relationships. Hotels pay 15-20% commission for every booking through OTA, which significantly reduces profit margin. In the long term, this can affect business sustainability, especially for properties with small scale. Customer data collected through OTAs is also owned by the platform, not by the hotel. This limits the hotel's ability to conduct direct marketing and build long-term customer relationships. When tourists book through OTA, their communication is more with the platform than with the hotel, reducing brand loyalty to individual properties.

Changes in OTA algorithms and policies can also have significant impact on hotel visibility and booking volume. Hotels must continuously adapt to changes in ranking algorithms, commission structures, and platform policies that are sometimes unpredictable. According to Chen & Wang (2023), balance between leveraging OTA for reach and visibility with building direct booking channels becomes a strategic imperative for modern hotels. Investment in direct booking engines, loyalty programs, and retention marketing can help reduce dependency on OTAs.

With increasing digitalization, cybersecurity risks also increase. Hotels store sensitive guest data including personal information, payment information, and travel details. Data breaches can result in financial losses, reputational damage, and legal liabilities. Many hotels, especially small ones, do not yet have adequate cybersecurity measures and protocols. Investment in secure IT infrastructure, employee training on cybersecurity, and compliance with data protection regulations like the Personal Data Protection Law still remains an area that needs significant improvement.

## **9. Digitalization Development Opportunities**

AI and machine learning technologies offer great opportunities for further optimization in various aspects of hotel operations. AI-powered chatbots can provide 24/7 customer service, answering common questions, handling booking inquiries, and addressing simple guest requests without human intervention. Predictive analytics using machine learning can help forecast demand with higher accuracy, optimize pricing strategies, and anticipate maintenance needs. Sentiment analysis from online reviews can provide actionable insights about areas of improvement.

Personalization engines can analyze guest preferences and behavior to deliver highly personalized experiences and targeted marketing messages. Some large hotel chains globally have already implemented AI-powered recommendation systems that suggest

activities, dining options, and services based on individual guest profiles. According to Buhalis & Sinarta (2019), AI will be a game-changer in the hospitality industry, with potential to transform every aspect of customer journey, from pre-arrival to post-stay engagement.

IoT technologies offer opportunities to create smart hotel environments that enhance guest comfort, convenience, and sustainability. Smart room controls that allow guests to adjust lighting, temperature, and entertainment systems via smartphone apps or voice commands have started to be adopted in several luxury hotels. Energy management systems with IoT sensors can automatically adjust HVAC, lighting, and other systems based on occupancy and preferences, resulting in significant energy savings. Water management systems can detect leaks and optimize usage, contributing to water conservation.

Keyless entry systems using smartphones or biometric authentication improve security and convenience. Guests don't need to worry about losing room keys and can access rooms seamlessly. IoT-enabled predictive maintenance can monitor equipment conditions and alert maintenance staff before failures occur, reducing downtime and repair costs. This is particularly important for maintaining guest satisfaction and operational continuity.

Virtual Reality (VR) can be used for virtual property tours, allowing prospective guests to "visit" hotels and explore facilities before booking. This is particularly effective for international travelers who cannot visit in person before making reservations. Augmented Reality (AR) can enhance on-property guest experience by providing interactive information about facilities, local attractions, and services. AR-powered navigation can help guests find their way around large resorts or explore nearby attractions. Virtual destination experiences can also be used as marketing tools, showcasing the beauty of North Lombok's beaches, underwater scenery, and cultural attractions in immersive ways that inspire travelers to visit.

Blockchain technology offers potential for more secure and transparent transactions, loyalty programs, and identity verification. Blockchain-based loyalty programs can allow seamless earning and redemption across multiple properties and brands. Some hotels globally have started accepting cryptocurrency payments, catering to tech-savvy travelers and reducing transaction fees associated with traditional payment methods. While adoption is still limited in Indonesia, this could be a future trend worth monitoring. Smart contracts powered by blockchain can automate various processes such as booking confirmations, cancellations, and refunds, reducing administrative overhead and disputes.

Digitalization offers tremendous opportunities for advancing sustainable tourism practices in North Lombok. Digital platforms can be used to communicate and promote hotel sustainability initiatives, raising awareness among guests about environmental and social responsibility. Carbon footprint calculators can help guests understand the environmental impact of their stay and offer options to offset emissions. Digital systems for monitoring and reducing resource consumption (energy, water, waste) align with global sustainability goals.

Community-based tourism platforms can connect tourists directly with local communities, craft makers, and tour guides, ensuring more equitable distribution of tourism benefits. Digital marketplaces for local products and experiences can support local economy and

preserve cultural heritage. Virtual experiences and digital content can reduce the need for physical travel in some cases, contributing to reducing overtourism pressures on sensitive ecosystems. Balance between promoting destination and protecting environment can be achieved through strategic digital tools. According to Gössling (2021), digital transformation and sustainability transformation in the tourism sector must go hand-in-hand, with technology serving as an enabler for more responsible and regenerative tourism models.

## **10. Role of Government and Stakeholders in Promoting Digitalization**

The North Lombok local government has a crucial role in creating an enabling environment for digital transformation in the hospitality sector. Supportive policy frameworks, regulatory clarity, and incentive programs can accelerate adoption of digital technologies, especially among small and medium-sized hotels. Tax incentives or subsidies for technology investments can help reduce financial barriers faced by small hotels. Simplification of licensing procedures for hotels that adopt digital standards can also serve as incentive mechanisms. Regulations on data protection, cybersecurity, and e-commerce need to be clear and enforceable to build trust in the digital ecosystem. Consumer protection regulations for online booking platforms are also important for ensuring fair practices.

Investment in digital infrastructure, particularly high-speed internet connectivity, is critical for supporting the digital economy in the tourism sector. The government needs to ensure that internet coverage and bandwidth are adequate not only in main tourist areas but also in developing destinations. Public WiFi at tourist attractions, transportation hubs, and public spaces can enhance visitor experience and support digital marketing efforts. Smart destination infrastructure with digital information systems, wayfinding, and emergency services can improve overall destination competitiveness. Collaborative initiatives between government and private sector in infrastructure development can optimize resources and accelerate deployment. Public-Private Partnership (PPP) models have proven successful in similar contexts in various countries.

Training programs for hotel owners, managers, and staff in digital skills and technologies are critical for successful implementation. Local governments, in collaboration with educational institutions and industry associations, can organize regular training workshops, certification programs, and knowledge-sharing sessions. Topics that need to be covered include: social media marketing, online reputation management, revenue management systems, cybersecurity basics, and customer relationship management. Practical, hands-on training is more effective than theoretical sessions.

Mentorship programs that pair digitally advanced hotels with those still early in their digital journey can facilitate peer learning and knowledge transfer. Success stories and best practices from local hotels can serve as inspiration and practical guidance. Digital literacy programs should also target the broader tourism workforce, including tour guides, transportation providers, and souvenir vendors, to create a cohesive digital ecosystem across the entire destination.

The North Lombok DMO needs to strengthen digital marketing capabilities to promote the destination effectively in digital channels. A comprehensive digital marketing strategy that

integrates website, social media, content marketing, search engine optimization, and online advertising is essential for reaching target markets. Collaboration with hotels in creating compelling content, joint marketing campaigns, and co-branded initiatives can amplify reach and impact. User-generated content campaigns that encourage visitors to share experiences on social media with destination-specific hashtags can generate organic publicity.

Data-driven marketing using analytics to understand visitor behavior, preferences, and booking patterns can inform more targeted and effective campaigns. Personalization in marketing messages based on visitor segments can improve conversion rates. Partnerships with OTAs, airlines, and tour operators in joint marketing initiatives can leverage combined resources and expertise for greater market penetration.

## **11. Comparative Study with Other Destinations**

Bali, as a mature destination in Indonesia, provides valuable lessons in digital transformation. The level of digitalization in Bali's hospitality sector is significantly higher with almost universal adoption of OTA platforms, sophisticated PMS systems, and active social media presence. Yusuf & Rahmat (2021) found that Bali's success in digitalization is supported by strong digital infrastructure, high levels of digital literacy among hospitality workforce, and proactive government support. Collaborative initiatives between hotels, DMO, and technology providers have created a thriving digital ecosystem. North Lombok can adopt similar collaborative models, scaled appropriately for local context. Learning from Bali's experiences can help avoid pitfalls and accelerate the digital journey.

Global destinations like Thailand, Vietnam, and the Maldives that have successfully leveraged digitalization for tourism growth offer additional insights. Integration of digital technologies across the entire tourism value chain from destination marketing to on-ground visitor services creates seamless traveler experiences. Estonia's digital governance model in tourism, Singapore's smart nation initiatives that include the tourism sector, and Dubai's comprehensive digitalization strategy demonstrate the potential for transformative impact when digitalization is pursued strategically and comprehensively. Adaptation of global best practices with consideration for local context, resources, and priorities can help North Lombok chart an effective digital transformation pathway.

## **12. Projections and Strategic Recommendations**

Based on current trends and global hospitality industry projections, digitalization in the North Lombok hospitality sector is projected to continue accelerating. OTA platform adoption rates among non-star hotels are expected to reach 85-90% by 2027, with increasing integration of advanced technologies like AI and IoT. Mobile bookings, which already account for a significant portion of online bookings, are projected to become the dominant channel by 2026. Hotels will need to optimize mobile experiences and consider mobile-first strategies in digital initiatives. Sustainability will become an increasingly important differentiation factor, with travelers actively seeking hotels with credible environmental and social credentials. Digital platforms that showcase sustainability practices will become essential marketing tools. Competition will intensify with potential new entrants and expanding supply. Hotels that successfully differentiate through superior digital experiences, personalized services, and authentic local connections will thrive.

## **D. Conclusion**

The conclusion section essentially contains the essence of the study and, at the same time, is also an answer to the problems studied in the article. Concerning this, the writing of the conclusion must be adjusted to the order of the problems studied and relevant to the research objectives. In the Conclusion section, there should be no new discussion or comments from the author. The conclusion can include the author's recommendations, if any.

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