



AI FOR HOSPITALITY WHITEPAPER

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Hospitality Technology Next Generation (HTNG), part of the American Hotel & Lodging Association (AHLA), has a mission to foster, through collaboration and partnership, the development of next-generation systems and solutions that will enable hoteliers and their technology vendors to do business globally in the 21st century. HTNG is recognized as the leading voice of the global hospitality community, articulating the technology requirements of hotel companies of all sizes to the vendor community. HTNG facilitates the development of technology models for hospitality that will foster innovation, improve the guest experience, increase the effectiveness and efficiency of hotels, and create a healthy ecosystem of technology suppliers.

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CONTENTS

AI FOR HOSPITALITY WORKGROUP OBJECTIVE

PAGE 5

1 DOCUMENT INFORMATION

- 1.1 Document Purpose
- 1.2 Scope
- 1.3 Relationship To Other Standards
- 1.4 Useful Resources
- 1.5 Audience

6

2 INTRODUCTION TO ARTIFICIAL INTELLIGENCE

- 2.1 Artificial Intelligence Terms and Definitions
- 2.2 Hospitality-related Definitions
- 2.3 What Does Artificial Intelligence Do?

8

3 HOSPITALITY CHALLENGES SOLVABLE BY AI/ML

- 3.1 Other Hotelier, Corporate Owner, and Property Management Challenges
- 3.2 Vendor Solutions

11

4 SPECIFIC USE CASES

- 4.1 Predictive Analytics Using AI for Operational Systems
- 4.2 Infrastructure and Application Availability and Visibility

13

5 AI IMPLEMENTATION STEPS

14

6 HOW CAN AI BENEFIT A HOTEL AND/OR ORGANIZATION?

15

7 SUCCESSFUL IMPLEMENTATIONS OF AI IN HOSPITALITY

- 7.1 Case Study 1
- 7.2 Case Study 2
- 7.3 Case Study 3
- 7.4 Case Study 4
- 7.5 Case Study 5

22

8 REFERENCED DOCUMENTS AND SOURCES



AI FOR HOSPITALITY WORKGROUP OBJECTIVE

Artificial intelligence (AI) is not well understood by the hospitality community, causing confusion in the marketplace and hesitation to adopt despite the potential of the technology and its applications across many business processes and problems. This also disincentivizes new market entrants from deploying new products.

The AI for Hospitality Workgroup has created a framework for hospitality AI strategies, including basic technology guidance and key deployment and implementation considerations. This will help hospitality professionals accurately evaluate the solutions marketplace and set the direction of AI adoption at their companies. This information will also increase the credibility of the hospitality market to industry newcomers, creating a competitive marketplace.

DOCUMENT INFORMATION

1.1 DOCUMENT PURPOSE

The AI for Hospitality Workgroup has created this framework for hospitality AI strategies, including basic technology guidance and key deployment and implementation considerations.

1.2 SCOPE

This whitepaper provides the reader with the following information:

- Introduction to AI
- How to select an AI development partner
- AI terms and definitions
- Several case studies of successful AI implementations
- Brief descriptions of product offerings from several AI development companies

1.3 RELATIONSHIP TO OTHER STANDARDS

Wherever possible, reference is made to other HTNG-developed standards and documents.

1.4 USEFUL RESOURCES

- www.cloudfabrix.com
- www.opstechpro.com
- www.bluiip.com
- www.globalreachtech.com
- www.refcor.com

1.5 AUDIENCE

The content of this document is directed toward hospitality management and development staff.

INTRODUCTION TO ARTIFICIAL INTELLIGENCE

Hospitality owners, service industry management companies, and franchises are delving into next-generation technology to lift their offerings out of the ordinary to a new level of service that sets their brand apart from the rest, ultimately improving:

- Revenue per available room (RevPAR)
- Cost per available room
- Customer service
- Guest retention

2.1 ARTIFICIAL INTELLIGENCE TERMS AND DEFINITIONS

The following table includes plain-English definitions of the terminology used in reference to artificial intelligence (AI) technology and within this document.

TERM	ALSO KNOWN AS	COMMON DEFINITION
Artificial intelligence	AI	Machines simulate human intelligence and problem-solving.
Artificial intelligence for operational systems	AI OPS	Using artificial intelligence to reduce machine noise for operators for the purpose of improving operational efficiency
Change management	CMDB	Change management database: Using AI to automate the change management tracking of all IT systems
Cognitive science	Cognitive behavior	Learning at scale with reasoning and purpose so that it can interact with humans naturally
Conversational AI		Recognition of requests and integrating a feedback loop to address related questions that are phrased differently.
Deep learning	DL	A way machine learning reviews history to mimic human behavior in AI.
End of life	EOL	System is no longer manufactured
End of support	EOS	System is no longer supported
IT service management	ITSM	Service desk for IT staff that consolidates all machine and end-user IT problem requests
Machine learning	ML	Computers learn from data without explicit programming. This is the part of AI that is "auto learning."
Mean time to detect	MTTD	Time to find a problem
Mean time to identify	MTTI	Time to identify a problem
Mean time to resolve	MTRR	Time to resolve a problem
Natural language processing	NLP	Recognizing parts of human language in order to create a response.
Predictive analytics		Using AI to analyze historical data to predict outages, degradation, budgets, and cycles
Robotic data automation	RDA	Using bots to elicit information on applications and infrastructure
Robotic process automation	RPA	Using bots to understand and improve machine-to-machine processes to deliver intelligent workflows
Security incident event management	SIEM	Provides organizations with next-generation security analytics and response; generally, a centralized system integrated into others that collects broad information for internal analysis and detection routines

INTRODUCTION TO ARTIFICIAL INTELLIGENCE

CONTINUED

2.2 HOSPITALITY-RELATED DEFINITIONS

The following table contains simple definitions of acronyms and terminology used within the hospitality industry applicable to this document.

TERM	COMMON DEFINITION
APs	Wireless access points or access points
Channel	The system in which reservations transact and complete
CRM	Customer relationship management
CRO	Central reservations office or central reservations
CRS	Central reservations system
OTA	Online travel agency
PMS	Property management system
RevPAR	Revenue per available room
RMH	Revenue management for hire or revenue management
SLA	Service level agreement or service level

2.3 WHAT DOES ARTIFICIAL INTELLIGENCE DO?

Artificial intelligence (AI) is the science of observance (collection of data), engagement (understanding the relationship of data), and action (remediating fault or change management database [CMDB]) through the application of systems algorithms in order to attain desired results—i.e., improved MTTD (mean time to detect) and MTTR (mean time to resolve).

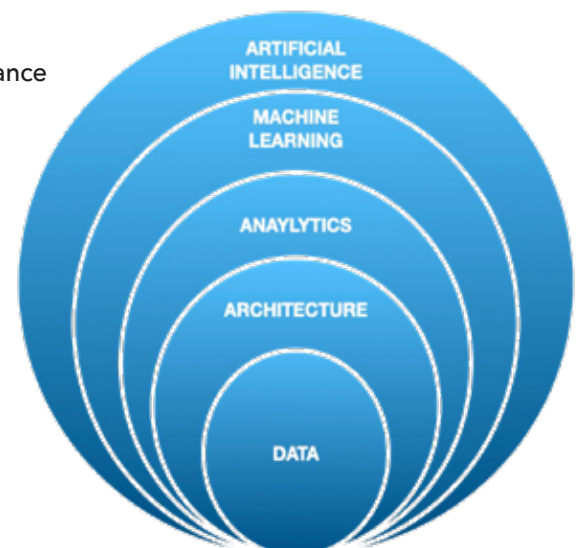
Machine learning (ML) uses “big data” information gathered from system data to understand anomalies, behaviors, changes, and norms and to create and document that knowledge. Predictive analytics uses data to draw inferences and correlations from machine learning to predict potential future outcomes. AI and ML can enhance the operating success of hospitality providers by improving problem detection and remediation speeds.

AI takes mundane, human-based, repetitive tasks and automates the decision-making process. ML provides unique insights and valuable, actionable information derived from the analysis of “big data.”

THE BOTTOM LINE: Utilizing AI and ML means doing more for less and getting more desirable outcomes.

- ✓ **Artificial intelligence:** Solves problems, learns, and plans
- ✓ **Machine learning:** Identifies predictive patterns in historical data
- ✓ **Analytics:** Evaluates input signals and outcomes
- ✓ **Architecture:** Structure defines key relationships
- ✓ **Data:** Systems-generated data on device health or performance

Building on this illustration, the next ring would be generative AI. Generative AI refers to the ability of machines to create new content, such as images, text, or even music, that closely resembles human-generated content. Generative AI differs from other forms of AI, such as discriminative models, by focusing on creating new data rather than classifying or predicting existing data. Generative AI can provide personalized experiences for customers by generating tailored recommendations for accommodations based on their preferences and historical data. This area is growing rapidly and needs constant attention and monitoring.



HOSPITALITY CHALLENGES SOLVABLE BY AI/ML

AI/ML addresses the areas that can be automated to improve ticketing, incidents, predictive failure and degradation of systems, visibility and observability of all systems, and speed to remediation. The systems can correlate service level agreements (SLAs) for things like wireless uptime, internet uptime, TV, and entertainment uptime.

Hospitality entities that implement AI/ML should prepare for organizational transformation. Areas of impact will include:

- Staffing
- Incident reduction on hotel systems
- Incident remediation (improved uptime)
- Predictive alerting
- Operational efficiency
- Improved security
- Efficient onboarding
- Data management
- Compliance (booking engines, reservations, property management system [PMS], etc.)
- Call reduction (front desk, call centers, operators)
- Improved analytics
- Context of system health, based on capacity

Examples of Operational Improvements:

Engineering: The ability to monitor all systems in a single pane of glass and get centralized alerting of problems or outages. Examples may be elevators, escalators, Wi-Fi, door locks, HVAC, firewall/networks/switches, televisions, IT systems, etc. This includes any device with an IP address connected to the network. End of life, end of support, and maintenance can all be automated using AI.

Telecom: The ability to monitor all systems and connections available in a single pane of glass. AI could also automate SLA monitoring by property or vendor (e.g., call centers, reservations centers and systems, concierge systems, etc.)

Marketing/Guest Experience: With the many internal and external property and customer data sets available, robotic data automation (RDA) allows professionals to select the data they want and make sense of it quickly. RDA enables hospitality to realize value from data faster by simplifying and automating repetitive data-integration, data-preparation, and data-transformation activities using low-code workflows and data bots, including built-in AI/ML bots.

Hospitality organizations and management companies will reap the rewards of the improved efficiencies and observability while at the same time improving spend for:

- Lab
- Tools
- Remediation
- Future forecasting
- Predictive analytics

Ultimately this automation results in:

- Optimized guest room availability
- Optimized room functions
- Improved guest services
- Improved RevPAR
- Lower cost per available room

THE BOTTOM LINE: AI and ML can be used to transform IT and operational systems in hospitality businesses and provide never-before-seen insights and information to make smart decisions quickly and deliver a targeted guest experience. What does this mean? One corporate system could do all of the above for all the internal customers and groups (e.g., engineering, IT, properties, brands, corporate, management) and provide each group with the visibility they require.

Contained in this section is a list of challenges that hotels face today for which current AI and ML technology could provide partial or full solutions.

3.1 OTHER HOTELIER, CORPORATE OWNER, AND PROPERTY MANAGEMENT CHALLENGES

BOOKING

Reservation change requests
Express check-in and check-out
Check-in processing
AI operator
Voice recognition
Booking engines, PMS, CRS
Interface outages

GUEST-FACING

Guest behavior
Labor challenges
High-caliber guest experience mapping

MANAGEMENT

Employee scheduling
Updates to processes and protocols
Optimize housekeeping rules

ENGINEERING/HOUSEKEEPING

Predictive failure of hardware/software
Room inspections
In-room control
Digital network outages/system down
Housekeeping requests
In-room service

CONCIERGE SERVICES

Digital concierge

TEXT-BASED SERVICES

Natural language communications
Voice compendium

FRONT DESK

Repetitive guest requests
Addressing guest challenges and feedback

FINANCE

Profit and loss statements
Revenue management
Rate optimization
Rate forecasting
Revenue allocation across all systems

IT SYSTEMS

System forecasting
Background and systemic data
Analytics/reconciliation
Change management
Help desk ticketing
Root cause resolution
Predictive degradation/failure

3.2 VENDOR SOLUTIONS

This section highlights the solutions available today that are targeted to the hospitality industry. Sample use cases are included, which deliver:

- A specific challenge
- A specific benefit
- Required elements to solve
- Expected outcome or solution

Where available, vendors in this workgroup have provided a meaningful case study that aligns the use case, shows how a solution has been successfully deployed, and covers the items listed above.

From this information and the use cases that follow, readers should:

- Understand what solutions are available
- Understand how these solutions apply to real use cases in the hospitality industry
- Understand which use cases have been successfully deployed in the hospitality industry
- Understand what is necessary to deploy these solutions in their own environment should they choose

Today, there are four primary AI solutions within hospitality:

1. **Voice and digital solution:** This is an application where AI would respond either verbally or through text on behalf of an organization in response to a consumer query. A good example would be a virtual operator.
2. **Task solution:** This is one where AI would deliver meaningful data and make decisions based on data. A good example of this would be revenue management systems.
3. **Offline behavior solution:** This is one where AI would monitor systems or other technologies to deliver information back. A good example of this would be a help desk or remote monitoring tool.
4. **Insight solution:** This would be wherein the AI monitors behavior to help identify anomalies and/or patterns.

Examples of these as applied to specific solution areas include:

✓ Voice and digital

- Contact centers
- Operators (central or local)
- Front desk
- Help desk or engineering
- Chat
- Social media
- Websites
- Ticketing or interaction

✓ Task

- Architectural
- Engineering
- Infrastructure

✓ Offline

- Data mining
- Resources and staffing
- Channel management

✓ Insight

- Revenue and rates
- Labor and forecasting
- IT infrastructure
- predictive analytics

Use cases with multiple solution types within hospitality might include:

- ✓ Space and inventory utilization
- ✓ Support and network troubleshooting
- ✓ Staff and departmental support:
 - Housekeeping
 - Front desk
 - Restaurants
 - Inventory supply
 - Back of house
 - Other departments
- ✓ Meetings and events

SPECIFIC USE CASES

4.1 PREDICTIVE ANALYTICS USING AI FOR OPERATIONAL SYSTEMS

For: Engineering, housekeeping, food and beverage, spa, conference facilities, rooms, financial

Challenge: Engineering systems make and break hotel readiness in facilities: The room that's "out of service," the restaurant with malfunctioning refrigeration or power systems, a wine room whose cooling is not tempered properly, rooms with HVAC issues or heating problems, a spa that needs chemical balance, or failing wireless.

Goal: AI/ML can provide alerts with predictive analytics, determine what systems are degrading and heading toward failure or outage, and avert that outage.

Outcomes:

- Problems are resolved before they threaten room or conference availability, yielding a 100% room availability status.
- End of life (EOL)/end of support (EOS) predictive budgeting—based on degradation, EOL and EOS components, software, and hardware—eliminates surprises in budgets and provides proper forecasting.

Prerequisites:

- Virtual machine on a server or in the cloud
- Access to all network systems and devices
- On-site tech support to facilitate upload of software
- System ingestion of data is required but is contained at the site or in a customer/CFX-approved cloud such as Amazon Web Services (AWS).

4

SPECIFIC USE CASES

CONTINUED

4.2 INFRASTRUCTURE AND APPLICATION AVAILABILITY AND VISIBILITY

For: Call centers, PMS, booking engines, point of sale (POS) systems, switches, firewalls, plumbing, elevators, every piece of hardware and software

Challenge: Every person at the property or engaged with the property is utilizing some form of technology as a guest or to assist a guest and further their experience. The systems are plentiful, and one problem can lead to a myriad of others. The IT department is responsible for ensuring everything is perfect; whether it's front desk, booking engines, reservation systems, POS, PMS, switches, virtual machines, firewalls, surveillance, security, cybersecurity, access control, voice over internet protocol (VoIP), access points (APs), or call centers, it's connected to the back room.

Goal: Use AI for operational systems (AI OPS) to ensure operational success on all systems, platforms, and applications at the data operation level.

All data infrastructure and applications running front and back offices, hybrid cloud systems, and on-premise systems can utilize AI/ML to improve the property uptime. Complex systems, data tools, and compliance impact the smooth running of the IT platforms behind the hotel operation. All systems are maintained and are visible in a single pane of glass, making it simple for support to recognize and remediate problems. The systems can be local, on-premise-based, cloud-based, or hybrid. Using an AI OPS system also ensures the implementation of new systems are layered in without changing the system programs to which they are attached.

Outcomes:

- 100% system uptime and 100% compliance yields guest satisfaction, returning guests, and raving fans.
- For employees: Less stressful jobs, immediate access to systems, and the ability to complete tasks quickly

Prerequisites:

- On-premise or cloud-based virtual machine
- Ability to access all hardware and software apps
- On-site tech support for oversight and enabling devices
- System data to remain on site or in customer-approved cloud, such as AWS

AI IMPLEMENTATION STEPS

The following is a simple outline of steps a hospitality company should take when procuring an AI solution:

- ✓ **Identify the problem and desired outcome.**
 - The use of AI/ML is specific. The structure of how AI/ML works is dependent on the data that feeds the system, the algorithms that express the desired output, and the desired output format, for example, voice interaction, dashboard, or feeding another system.
 - Understand the AI/ML use strategy as part of the brand.
- ✓ **Determine reasonable, normalized sources of data and infrastructure.**
 - Identify the data sources that feed to meet the problem. For example, to determine how weather affects labor, identify data sources for weather endpoints and the labor system.
 - Identify the volume and length of data.
 - Network infrastructure and connectivity support those data sources.
 - Data output and AI/ML usage rely on accurate and normalized input data. The cleaner the data points, the better the output. Vendors should be able to determine the cleanliness of the data.
- ✓ **Match AI/ML use cases to vendors or products.**
 - Search via the internet, professional groups, or consultants for vendors or solutions that match the problem and outcome.
 - Most AI/ML vendors specialize in different services. Many providers offer AI/ML solutions adjacent to a core product; casting a wide net is a strong approach.
- ✓ **Evaluate providers.**
 - Work with solution providers to evaluate the problem and desired outcome.
 - Find the strongest vendors matching the use case. Evaluate previous projects, costs, timelines, capabilities, and methods of algorithm tuning.
 - Get demonstratable examples using provided data samples.
- ✓ **Select a solution.**
 - Work with the vendor to develop a statement of work with a vendor system objective.
 - Ask for a pilot with a greater data sample.
 - Define success with the vendor and create key performance indicators for measuring outcomes.
 - Refine algorithms.
- ✓ **Pilot the solution.**
 - Determine a limited set of areas in which to pilot (i.e., test) the solution.
 - Define metrics and thresholds for evaluating performance and success.
 - Implement the solution, and begin to gather metric data.
 - Adjust, refine, and retest as necessary prior to the full rollout.
- ✓ **Calculate the return on investment (ROI).**
 - Determine the cost of the existing processes and pre-AI approach.
 - Create ROI metric categories (not necessarily financial).
 - Measure and document results.

HOW CAN AI BENEFIT A HOTEL AND/OR ORGANIZATION?

AI is all about providing more complete data, analyzing data, and delivering an action on that data.

In the guest-facing space, automation of data allows a guest to interface human to machine and accomplish a majority of their requests with digital responders. Alternatively, the guest may interface with a front desk employee who has automated systems to respond to the guest more efficiently. The impact: Speed to satisfaction.

In the room, AI can ensure room availability and preempt engineering faults, providing improved room availability. The impact: Improved RevPAR and cost per available room.

For housekeeping, automated housekeeping requests can provide interactive and useful automated responses more quickly to requests for towels, spa readiness, bedding, etc. The impact: Speed to satisfaction.

For food and beverage, automated systems and inventory analysis provide information about low supply, machine status, POS systems, etc.

For data systems:

- Power systems
- Battery backup
- Network connections
- Entertainment
- Telephony and internet connectivity
- Applications

AI monitors and reports on systems uptime, issuing alerts for when a battery's useful life wears down and providing replacement information to avert outages and downtime. Network and IT systems are proactively monitored for degradation, fiber cuts, and events beyond the property's control. Tickets are aggregated, correlated, enriched, and dispatched with suggestions for remediation and resolution.

AI can benefit a hotel and/or organization by addressing the foundational underpinnings of systems:

- ✓ See service degradation on all systems and applications.
- ✓ Get predictability of pending failure on all systems and applications.
- ✓ See functionality of all APs, PMS, and booking engines.
- ✓ See degradation of network access, VoIP, data, and entertainment systems.

Wireless issues:

- ✓ If wireless goes down, how do you respond?
- ✓ How could AI help to ensure fully functioning wireless?
- ✓ If system failures occur during conventions and meetings (e.g., wireless, projectors, screens, TVs), what does downtime do to SLAs?

PMS issues:

- ✓ If a PMS goes down, what happens?
- ✓ Does the loss of a switch port in the data room impact serviceability in a guest room or in the lobby, convention areas, etc.?

Thermostat issues:

- ✓ Guest room is too hot or too cold.
- ✓ Hot switch room
- ✓ Spa out of service
- ✓ Power surges
- ✓ No hot water

Problem identification and resolution:

- ✓ Root cause identification
- ✓ Reduced MTTD
- ✓ Reduced MTTR
- ✓ AI impact runs across all areas of issue resolution

AI can respond to all these today. It can look at the whole system of applications and hardware and determine/predict failure, degradation, errors, and root cause failures. AI can additionally provide remediation suggestions to faults.

SUCCESSFUL IMPLEMENTATIONS OF AI IN HOSPITALITY

This section contains examples of several successful implementations of AI in hospitality, each provided by a workgroup vendor member.

7.1 CASE STUDY 1

How one property management group used ML to overcome siloed tools; reduce incident and ticket volumes, MTTR, and MTTD; and unify logs, traces, and metrics.

Challenge:

The owner's rapid expansion of hospitality properties led to disparate tool and system analytic uses.

- Multiple monitoring and log analysis tools
- Network operations center (NOC)/security operations center (SOC) contention and complications due to multiple tools across multiple platforms
- Partial and insufficient incident data
- Handoffs required between multiple teams and high incident volume
- Increased downtime frequency and duration from e-commerce and POS systems
- Heavy investments in robotic process automation (RPA), but workflow was still not optimal, lowering ROI

Solution:

To resolve the problem, CloudFabrix deployed its Incident Room app and Asset Dependency Mapping app. Integrating with the existing disparate data sources, IT service management, CMDB, monitoring tools, log analytics tools, security incident event management (SIEM) tools, and RPA tools allowed the complete transition of the NOC/SOC and service desk operations to the CloudFabrix solution.

Resolution steps:

- 1) Aggregate similar alerts into a problem and pinpoint root cause incident
- 2) Insights, recommendations, and remediation workflows in one place
- 3) Provide rich, contextual telemetry and log data for swift diagnosis
- 4) Detect and guide teams with insights on anomalies detected
- 5) AI/ML recommendations present similar incidents to serve as a knowledge base
- 6) Self-learning system provides recommendations on next steps and SME allocation

Outcomes:

- Reduced downtime
- Improved NOC/SOC efficiency
- Improved customer experience
- End-to-end visibility
- Data consolidation

SUCCESSFUL IMPLEMENTATIONS OF AI IN HOSPITALITY CONTINUED

7.1 CASE STUDY 1 CONTINUED

ROI achieved in under 180 days

KEY SUCCESS METRICS	BEFORE CFX	AFTER CFX
MTTD	60 minutes	<15 minutes
MTTR	8 hours	<1 hour
Automated diagnosis	N/A	65%
Automated resolution of incidents	N/A	25%
Full-time equivalent efficiency improvements	N/A	50%

Implementation:

1. CFX product deployment architecture and requirements:
 - a. Deployment model: On premise or software as a service (SaaS)
 - b. On-premises will require up to six virtual machines, 16-64T of memory, and appropriate storage, depending on the number of IT assets and the number of application sources.
2. Supported virtual infrastructure and cloud platforms are VMware, AWS, and Google Cloud Platform (GCP)
3. On-premise deployment: CloudFabrix provides VMware open virtualization formats (OVFs)/ AWS Amazon Machine Images (AMIs) for product deployment.
4. If the customer chooses to use CloudFabrix SaaS environment, they just need to deploy gateway/collector in their environment with appropriate access from CloudFabrix.

SUCCESSFUL IMPLEMENTATIONS OF AI IN HOSPITALITY CONTINUED

7.2 CASE STUDY 2

MSP (managed service provider) uses AI to improve operational efficiency. AI and ML are applied to drive efficiency for MSP with 400 sites and eliminate change management drift.

Challenges:

MSP lacks visibility of IT assets and infrastructure. Using AI OPS and ML to apply algorithms provides visibility, interdependency, and ticket aggregation.

- MSP has 400 sites serving multiple hospitality flags with managed services, remote IT, and cloud adoption services.
- Each site has region-specific apps, server infrastructure, and other networking requirements.
- Lack of business context in IT OPS
- Configuration drift posing security risks
- Prolonged incident detection and resolution times
- High ticket volumes
- Delayed root cause analysis impacting SLAs
- No single view of IT OPS behavior across multiple sites

Solution:

Current vendor-specific tools provide limited information to drive decisions and/or investments. To resolve the problem, CloudFabrix identified that:

- AI software would serve as a digital MSP business platform to bring hospitality business and application context to IT OPS and provide chief information officers (CIOs), IT leaders, and personnel with holistic IT OPS visibility and renewed insights and intelligence, helping to modernize the overall organization.
- Integration with existing vendor performance monitoring tools and configuration management tools to protect customers' investments and provide higher-level analytics on top of data sourced from such systems

SUCCESSFUL IMPLEMENTATIONS OF AI IN HOSPITALITY CONTINUED

7.2 CASE STUDY 2 CONTINUED

Outcomes:

- On-demand CIO dashboard provided single-pane view of IT OPS footprint from business context
- MTTD reduced by 40%
- Clear, quantifiable indication of luxury, business, and economy behavior
- 30% reduction in IT ticket resolution times
- 40% reduction in IT ticket volume
- Improved partner and guest trust with accurate quarterly compliance reporting
- In less than eight weeks, MSP properties were able to actively govern their environment and ensure locations, systems, and applications were delivering expected outcomes.

Implementation:

The average deployment of a new ML/AI solution set is 6-8 weeks. IT will take the system an additional 8-10 weeks to fully utilize stored alert data to go into predictability mode. Look at it as a 10-day weather map, showing probability of slowdowns and failures, in which devices, based on historical data.

CFX product deployment architecture and requirements:

- Deployment model: On premise or SaaS
- Supported virtual infrastructure and cloud platforms are VMware, AWS, and GCP
- On-premise deployment: CloudFabrix provides VMware OVFs/AWS AMIs for product deployment.
- If the customer chooses to use CloudFabrix SaaS environment, they just need to deploy gateway/collector in their environment with appropriate access.

SUCCESSFUL IMPLEMENTATIONS OF AI IN HOSPITALITY CONTINUED

7.3 CASE STUDY 3

Jeanie AI System from SP Square, now OpsTechPro for repetitive information using natural language processing (NLP)

Challenges:

Reduce congestion and service delivery requirements at the front desk. Alleviate guest frustration from waiting on hold for a simple request to be logged and actioned.

Solution:

- Jeanie sends a welcome message to each guest.
- Guest requests are converted to a ticket and instantly sent to an employee.
- Jeanie answers all commonly asked questions.
- Jeanie communicates with all guests at once.

Outcomes:

- Save on labor
- Increase revenue
- Improve guest satisfaction
- Excellent service and support

Example: At a 116-room limited-service branded hotel:

- AI technology answered 1,238 guest requests
- Average time to manually answer guest requests: 2 minutes
- $1,238 \text{ requests} \times 2 \text{ minutes} = 2,476 \text{ minutes saved total}$
- **Therefore, AI saves about 83 minutes per day and 511 hours per year.**

Implementation:

Requires a completed Excel setup form that encompasses information on the property, management company, rooms, locations, employees, and equipment.

Training: 60 minutes post-installation via Zoom.

SUCCESSFUL IMPLEMENTATIONS OF AI IN HOSPITALITY CONTINUED

7.4 CASE STUDY 4

BluIP AI System for improved call center service

Challenges:

Customer had three primary areas of implementation:

Guest-facing:

- Clunky experience
- Calls answered slowly
- Several steps to remediate questions

Contact center:

- Struggled with service level, staffing, and turnover
- Lacked intelligent insight
- Training
- ROI

Brand/corporate office:

- Costs were too high
- Solutions were not scalable

Solution:

Implemented in four phases, artificial intelligence was introduced along with other products to solve multiple issues and provide a seamless guest experience.

✓ Phase 1:

- Consolidate primary rate interface (PRI) to session initiating protocol (SIP).
- Reconciliation of phone numbers
- Use a smart router with AI to front guest geographical locale.

✓ Phase 2:

- Pilot program with five hotels to solution AIVA™.
- Solve more than 50% of calls with this product.

✓ Phase 3:

- Roll AIVA™ out to all hotels, contact center, and brand using program AIVA Connect™.
- AIVA Connect™ is a platform connecting mediums of data and infrastructure to AIVA™ to solve guest and owner questions through either phone or digital interaction within one screen.

✓ Phase 4:

- A finalized, robust version of AIVA Connect™, which integrates CRS and historical reservations to the caller interaction

Outcomes:

✓ Guest-facing:

- Enhanced and consistent experience
- Calls answered immediately
- AIVA™ is always on

✓ Contact center:

- Increased data and insight
- Increased efficiency
- Operate with reduced staff
- Reduced training time
- Reduced handling time
- Quick ROI
- Scalable

✓ Brand/corporate office:

- Reduced costs
- Fewer customer headaches
- Scalable

SUCCESSFUL IMPLEMENTATIONS OF AI IN HOSPITALITY CONTINUED

7.5 CASE STUDY 5

AI-driven booking flow from Arvoia, now GlobalReach Technology

Challenge:

Loss of direct booking revenue, brand loyalty, and reduced marketing ROI due to increased use of online travel agencies (OTAs).

- Hotel customers find it easier to book on OTAs than hotels directly.
- Hotel revenue loss from OTA bookings due to commission payments and brand loyalty (OTA owns the guest relationship)
- Reduced marketing ROI as customers fail to convert once on the direct site
- 52% of customers visit the hotel direct site after searching on an OTA; customers want to book direct due to better deals and/or brand loyalty.
- The hotel tech ecosystem is complex and fragmented, and hotels lack the expertise and funds to compete with advanced OTA technology.

Solution:

Apply Arvoia AI models to search results to provide recommended results for every site visitor.

To address these challenges, Arvoia deployed AI across the search results for 48 hotel sites:

- Ingestion of hotel search and booking data points for room and property searches
- Model trained on behavioral data collected
- Using the Arvoia AI application programming interface (API), search results were reordered and returned for each customer search in less than 200 milliseconds
- Automation of model performance management ensured a constant state of optimization
- Automation of model retraining using updated search behavior
- Automation of model optimization and deployment pipelines (inception to production in under 20 minutes)
- Automation resulted in the deployment of 11 models in 10 weeks and over nine model retrains. Model creation based on analysis of audiences (e.g., by brand, device, loyalty, channel).

Outcome:

711% improvement in revenue uplift from AI within eight weeks

- 7.3% increase in revenue within eight weeks
- 3.9% uplift in conversion within eight weeks
- 3.2% increase in average booking value within eight weeks
- Six-figure incremental revenue
- 20% increase in repeat bookers
- 6% increase in lead time
- 9% reduction in time to book
- Uplift in ROI across primary acquisition channels (those with highest marketing spend)

REFERENCED DOCUMENTS AND SOURCES

The following section lists the documents and sources used in creating this paper.

Robert Cole, RockCheetah Consulting:
"AI Concepts for Hospitality"

Dennis Nils Drogseth, EMA RADAR/CloudFabrix:
"EMA Radar for AIOPS Q3 2020, An Enterprise Management Associates® Radar Report"
(License granted to CloudFabrix)

Case Studies 1 and 2: Refcor/CloudFabrix

Refcor is an IT services firm that specializes in providing clients with AI-based software development, AI OPS software, and IT operations consulting. Refcor's software development services are focused on AI, production planning, MSPs, and various vertical markets. Working with AI OPS partner, CloudFabrix, Refcor provides visibility into large-scale (Fortune 500), complex corporate IT environments with a focus on radical reduction in MTTR, incident tickets, and operational costs. In addition, CloudFabrix AI OPS software utilizes AI/ML algorithms to predict IT incidents as well as recommend corrective actions.

CloudFabrix is AI OPS software that is ranked in Gartner's top quadrant and in EMA Radars' Top Value for AI/ML OPS. CloudFabrix has been delivering product since 2018 and includes top 100 organizations in every vertical market. Headquartered in Palo Alto, California.

Case Study 3: SP Square, now OpsTechPro

SP Square, now OpsTechPro, was developed by hospitality software veterans Paul Dickson and Jay Visnjic. Dickson was the co-founder of the highly successful "hotel ServicePro" application, a hotel service optimization, workflow, and asset management system for hotels. Visnjic was co-founder of the hotel booking engine "Travel Rewards Tonight." Together, Dickson and Visnjic co-created one of the hospitality industry's fastest growing companies.

SP Square features the newest technology to enhance guest satisfaction, guest communication and engagement, staff productivity, and asset management. SP Square is the only system to include guest text messaging with artificial intelligence, "Jeanie."

Case Study 4: BlulP Systems

BlulP is a Tier1 global service provider with strong ties in the hospitality, retail, restaurant, healthcare, and government industries. With a core group specializing in integrations and development, BlulP delivers in-demand solutions such as AI, agent/operator consoles and dashboards, ticketing systems, contact center solutions, cloud communications, staff alerting, Teams cloud call-in, custom development and applications, and much more.

BlulP is committed to delivering desired outcomes with white-glove service while supporting customers with superior service.

Case Study 5: Arvoia, now GlobalReach Technology

Founded in 2014, Arvoia, now GlobalReach Technology, has built and deployed some of the travel technology industry's most innovative AI, retail, and distribution solutions. Arvoia is a winner of numerous awards such as Phocuswright Innovator of the Year and a raft of European AI awards, including Best Application of AI at the Data Science Awards. The company finished 8th in Deloitte's 2018 Fast 50, which recognizes the fastest-growing technology companies in Ireland, and most recently was finalist in the Best Use of AI in a Consumer/Customer Service Application category at the AI Awards 2021. Arvoia's most significant client advocates include Travelport, Flight Centre, Gulf Air, and P3.

Arvoia believes hospitality starts with the first digital handshake, and its purpose is to help client companies improve their business and customer performance using AI. Arvoia's goal is to help hospitality companies drive more direct bookings and regain ground lost to digital-first OTAs and alternative accommodation providers. Its strategic aim is to elevate every global hospitality booking engine to be fully AI-driven without the hotel having to invest in new technology and to drive real and sustainable direct-to-hotel online business performance.