Hotel Productivity Benchmarking

An APO study across seven cities in Asia

The Asian Productivity Organization (APO) is an intergovernmental organization that promotes productivity as a key enabler for socioeconomic development and organizational and enterprise growth. It promotes productivity improvement tools, techniques, and methodologies; supports the National Productivity Organizations of its members; conducts research on productivity trends; and disseminates productivity information, analyses, and data. The APO was established in 1961 and comprises 21 members.

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JANUARY 2023 | ASIAN PRODUCTIVITY ORGANIZATION

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FROST & SULLIVAN served as the volume editor.

First edition published in Japan
by the Asian Productivity Organization
1-24-1 Hongo, Bunkyo-ku
Tokyo 113-0033, Japan
www.apo-tokyo.org

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Designed by Samvac LLP

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FOREWORD

The COVID-19 pandemic has adversely affected the hotel industry across APO member economies, particularly in cities where the economies were heavily dependent on incoming foreign tourists. The loss of tourism revenue has affected other businesses and employment opportunities. Global travel restrictions drastically reduced tourist arrivals in many cities, driving hotel occupancy rates down. Hotels have also had to change operational processes to cope with the new realities caused by the pandemic. As many hotels were forced to reduce staff due to low profitability, productivity also decreased, with hotels pivoting to a survival mindset while waiting for the pandemic's end.

In APO members, the hotel industry is a key player in the tourism landscape and a major contributor to national economies. It is important to ensure that hotels continue to raise productivity levels to maintain sustainability and continuous growth, particularly for those that operate in a manpower-scarce environment. It is essential to develop a vibrant, innovative hotel sector to ensure sustainable performance, promote competitiveness, and support a pro-business regulatory environment. Thus, it is important to understand the productivity levels of the hotel industry by providing benchmarking indicators against which they can compare their performance with that in cities elsewhere.

The APO conducted joint research with the Singapore Tourism Board by commissioning Frost & Sullivan to benchmark and compare the overall productivity levels of the hotel industry in the seven cities of Bangkok, Hong Kong, Kuala Lumpur, Seoul, Singapore, Taipei, and Tokyo. Key factors contributing to hotel productivity were analyzed. This publication presents the results of that research, makes practical recommendations, and offers insights on best practices applicable to the hotel industry to increase productivity.

The efforts of the team of experts from Frost & Sullivan who conducted the research and wrote this publication are very much appreciated. The APO expects that Hotel Productivity Benchmarking: An APO Study across Seven Cities in Asia will serve as a useful guide for raising the value and appeal of hotel-related employment, improve service quality, and ensure continuous improvements to sustain the industry's development in the long term during the postpandemic period. It is also hoped that the innovative strategies and technology for enhancing hotel productivity described will be adopted in APO member economies.

Dr. Indra Pradana Singawinata
Secretary-General
Asian Productivity Organization
Tokyo

EXECUTIVE SUMMARY

Frost & Sullivan was commissioned by the Asian Productivity Organization (APO) to study productivity and what it means to hotels across seven cities and different tiers for five years from 2015 to 2019. The study across hotels in Bangkok, Hong Kong, Kuala Lumpur, Seoul, Singapore, Taipei, and Tokyo was conducted from June 2020 to August 2021. To meet our objectives, the research team conducted 90 interviews with hotel managers, including general managers and managers, with an operations background. To solidify the qualitative findings, the team also collected 140 data points to analyze key hotel and productivity metrics.

The study indicates that hotels in Singapore have the highest labor productivity and profitability as compared to hotels in the other six cities. This is largely due to the country's political stability and readiness, including the government's foresight and the initiatives taken up by it. Hotels in Singapore have also benefitted from adequate availability of manpower and higher Average Occupancy Rate (AOR) and Average Room Rate (ARR). The productivity success can also be attributed to the industry's initiative in driving productivity improvements across the nation.

TABLE 1

OVERALL PROFITABILITY INDICATORS OF HOTELS IN SEVEN CITIES (2015–2019)

Indicator Average	Overall Profitability Indicators							
	STB (2016) *	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
ARR (in USD)		199	140	150	121	179	159	231
RevPAR (in USD)		147	118	122	90	142	108	141
AOR (in %)		86	81	71	69	83	86	84
Annual revenue per worker (in USD)	173,581	139,903	73,793	77,161	48,933	90,908	109,572	95,297
Annual value add per worker (in USD)	122,613	95,674	36,972	51,080	32,461	73,451	89,752	65,548
Annual gross operating profit per worker (in USD)	75,077	69,297	66,899	65,001	69,322	84,729	70,494	69,297
Annual operating cost per worker (in USD)	98,503	44,229	36,820	26,081	16,473	17,457	19,820	29,749

Note: STB, Singapore Tourism Board; RevPAR, Revenue per Available Room.
* Based on STB's internal study in 2016.

As can be concluded from Table 1, the developed cities of Hong Kong, Seoul, Singapore, and Tokyo performed better than the others in terms of profitability indicators.

The study also explored the business models of hotels in different cities and noted that they adopt a business model based on the local business environment. While hotels in Hong Kong, Seoul, and Tokyo adopt the lean model by outsourcing key functions and adopting new technologies to reduce manpower costs, Bangkok, Kuala Lumpur, and Taipei take a cost-saving approach since they have weaker currencies, which results in lower room pricing. Among the seven cities, Kuala Lumpur has the highest level of technology adoption and utilization of outsourced vendors due to lower expectations of profitability. Hotels in cities like Bangkok and Taipei lag in productivity transformation as they lack awareness of the need to digitalize and streamline operations. However, Taipei has witnessed an expansion of international hotels in the last five years and there is an emergence of new entrants in the city. The growing prominence of international hotel standards has changed the industry's dynamic and is driving productivity efforts in Taipei.

Frost & Sullivan identifies that technology adoption by hotels does not directly translate into higher productivity. Among the cities in this study, the hotels in Singapore have the highest profitability and labor productivity despite being low on technology adoption. Hong Kong, Seoul, and Tokyo have lower levels of labor productivity in terms of employee hours per occupied room despite higher levels of technology adoption. This could be the result of technology leading to unproductive employee hours since more time is required to learn new technologies. As the study indicates, hotel employees in the other six cities have more idle time than those in Singapore. Further, countries with low AOR such as Kuala Lumpur (69%) and Taipei (71%) have witnessed an overall increase in idle time, which is negatively impacting employee productivity.

Outsourcing of Employees

Hotels across different cities adopt varying business models due to various factors including the political and business environment in their country and the availability of resources like the level of economic and technological progress and manpower landscape. Among the cities, the hotels in Hong Kong, Kuala Lumpur, Seoul, and Tokyo have a high utilization rate of outsourced employees. Since outsourced vendors are classified as variable costs, these four cities leverage the flexibility of employing outsourced labor based on the forecast of customer traffic. Such a business model helps reduce the overall manpower cost and the hotel's liabilities as well. In the case of Kuala Lumpur, mitigation of operating costs is crucial due to low profitability indicators.

The use of outsourced vendors in hotels is relatively low in Bangkok, Singapore, and Taipei as these cities enjoy lower labor wages due to the availability of diverse talent. Singapore utilizes foreign workers to support key hotel functions, while Taipei and Bangkok take advantage of talent from rural and less-developed areas of the country. However, during the last five years, hotels in all seven cities have started to adopt the outsourcing model. Since 2017, hotels in Singapore have increasingly shifted towards utilizing outsourced vendors due to tightened restrictions on the foreign dependency ratio. Taipei's rate of outsourced vendors remains low to moderate as businesses are more risk-averse and are skeptical about using outsourced employees.

Overall, housekeeping (HK) sees the highest utilization rate of outsourced employees among all functions, as it is laborious and repetitive. In addition, a high utilization rate can be found within the Food and Beverage (F&B) function. Previously, hotels preferred to cultivate and grow their F&B

service crew to align with their service standards and quality. However, hotels are shifting their business approach to leverage outsourced manpower to allow employees to undertake more customer-centric roles or functions that require a higher level of decision making which cannot be undertaken by outsourced employees. Amongst all hotel functions, Front Office (FO) sees the lowest utilization rate as this role is largely customer-facing. Hence, more consideration is given to the use of outsourced vendors.

The utilization of outsourced vendors is prevalent in upscale and mid-tier hotels, while budget hotels outsource less frequently as hotel operations tend to be smaller in size, and jobs and roles can be easily completed by internal employees. In recent years, luxury hotels have started to outsource employees to lighten internal employees' workloads and reduce additional costs and effort for hiring, training, and managing new employees. Outsourced employees come with years of experience in similar roles. Hence, a lesser training effort is required from the hotel. Additionally, the management of employees is under the purview of an outsourced vendor instead of the hotel's internal team.

Labor Productivity

Across the board, hotels in developed cities such as Hong Kong, Seoul, Singapore, and Tokyo have high productivity levels, requiring only four hours per occupied room. This high productivity level can be attributed to the high occupancy rate. However, hotels in Bangkok, Kuala Lumpur, and Taipei perform at a lower level with employees requiring at least six hours per occupied room. This can be attributed to the lower occupancy rate and a lack of manpower planning which leads to the higher deployment of full-time equivalents (FTEs) during the lull period.

Adoption of technology does not directly translate into productivity or operational efficiency

While technology adoption can help automate back-end operations, the improvement of productivity around the front office, housekeeping, and F&B is largely driven by constant training and development, identifying productivity gaps, and revising operational processes. Across all cities, hotels in Singapore emerged as the leader in terms of labor productivity as evident across all functions for the employee-hours-per-occupied-room indicators. Despite incorporating more technology, Hong Kong, Seoul, and Tokyo hotels display lower labor productivity levels. Hotels in Bangkok, Kuala Lumpur, and Taipei have lower labor productivity and lower levels of technology adoption.

Realizing productivity benefits from technology adoption requires the participation and engagement of customers, hotel management, employees, and key supporting industries. Since new technologies make existing technologies obsolete, refining internal processes and the adoption of technologies may not necessarily drive continued productivity benefits without readjusting and upgrading processes. Besides, adopting new solutions for building management can be challenging as older hotels may not have the infrastructure to integrate new technologies.

Another key factor that hinders productivity despite the adoption of technology is the lack of a uniform system across hotels. The adoption of different technology brands and the decentralization of systems impact the overall productivity level since additional time is needed to synchronize information. Also, many employees at the front office and in housekeeping and F&B may not be well-versed with technology and fail to utilize new systems to speed up work processes. Hence, several technologies may become obsolete if the participation rate of employees is low.

Technology adoption analysis examines the productivity sentiments of hotels, their technology adoption rate, the number of technologies implemented, and the cost of investment across the

various cities. The study identified that the rate of technology adoption does not have a direct correlation with the profitability levels of hotels.

High technology adoption rate, high productivity, and profitability

Hotels in Hong Kong, Seoul, and Tokyo have to bear high labor and operational costs as most of the staff in these cities are locals. To mitigate such expenses, hotels in these cities use technology tools to streamline the processes and cut down on the need for a larger workforce. A high level of technology adoption is observed in these cities. Productivity and profitability indicators in the three cities are also relatively in line due to high customer volumes and healthy ARR.

Low technology adoption rate, high labor productivity, and profitability

Singapore is a unique case with the hotels in the city demonstrating a high level of profitability and a low level of technology adoption. High profitability indicators are factored by high ARR and AOR while operating and manpower cost remains low due to reliance on government grants and foreign workers. In addition, the productivity measures implemented in Singapore align with the overall perception of the hotels' productivity performance, as all productivity indicators reflect low sentiment towards the productivity drive and technology adoption. Despite the low drive to invest in more technology, hotels in Singapore have the highest level of labor productivity in terms of employee hours per occupied room due to their high AOR.

High cost of investment, process changes, and downsizing of teams are some of the other reasons for the low drive to replace human labor with technology. The STB's move towards productivity growth is championed by a few industry leaders but there is still a lack of involvement from most hotels, especially the budget hotels. Overall, while the rate of technology adoption is relatively high in the upscale and mid-tier hotel segments in Singapore, budget hotels exhibit 0–20% adoption across the various functions.

Low technology adoption rate, high productivity, and moderate profitability

Bangkok is a standalone case due to its high productivity indicators and moderate profitability indicators. It has been observed that hotels in Bangkok have high technology adoption rate and implemented several technologies across departments. Despite the city's low labor wage, the technology adopted by the hotels in Bangkok has helped in improving the overall productivity level and maintaining profitability due to lower ARR.

Mixed technology adoption rate, moderate productivity, and low profitability

Low profitability indicators and moderate productivity indicators are observed in Kuala Lumpur and Taipei. The number of tourists has declined significantly during the period of political unrest, affecting the overall occupancy rate. In addition, the weak currency exchange often leads to low ARR which affects overall profitability. Among the two cities, the hotel industry in Kuala Lumpur is seeing moderate advancement in technology adoption while Taipei's is lower since technologies, such as Artificial Intelligence (AI) and the Internet of Things (IoT), are still at a nascent stage.

Key Takeaways

The key takeaways in this study redefine the essence of productivity through various factors.

- Productivity improvement results from a combination of labor productivity, profitability, and the rate of technology adoption. A hotel's productivity strategy should also take into

consideration manpower deployment, cost maximization, identification of productivity gaps, and customer sentiment. The over-usage of technology may underserve its intended purpose.

- Each hotel has different Standard Operating Procedures (SOPs) and operational processes across its various departments. Technology adoption should be assessed based on the hotels' operating processes, unproductive areas, and suitability. Hotel managers should assess and identify unproductive areas before adopting any technology to yield better productivity.

- Technology is more suited for back-end work and supporting functions such as marketing, sales, and engineering to drive profitability.

- Key functions, such as the front office, housekeeping, and F&B, are still people-led due to their precise nature and the ability of humans to make decisions. Besides, since the hospitality sector is a service-oriented industry, the human element is crucial.

- Consumers' receptivity levels and the overall availability of resources also account for the feasibility of process improvements.

Singapore Analysis

Singapore's strategic location and stability boost its tourism and hospitality industries

Singapore's strategic location, regional relationship with other nations, and national stability have made it a tourism hub with 20% growth during the last five years. The high inflow of travelers has enabled hotels to leverage economies of scale due to high utilization rates (AOR) and increasingly sophisticated and tech-savvy customers. Compared to Singapore, hotels in cities such as Bangkok, Hong Kong, and Taipei face high volatility due to geopolitical risks affecting the flow of tourists. The fluctuation in inbound tourism greatly impacts productivity since hotels are unable to leverage the economies of scale on new technologies or frameworks as their key focuses are profitability and cost reduction.

Government's approach: Singapore leads in productivity across Asia due to a consistent effort by the government

Productivity diffusion started early in Singapore with the nation's plan to raise its productivity levels across various sectors; the STB has been making effort to transform the tourism industry. Since 2015, STB has identified challenges and recognized the need to raise productivity awareness by identifying champions to initiate growth and change.

Government's approach: Singapore's manpower crunch forces hotels to improve their productivity levels

Unlike Taipei and Bangkok which have adequate talent pools and comparatively low labor wages, Singapore faces a lack of talent diversity in the hotel industry, which has led to a manpower crunch in the sector at the national level. Due to the constraints and the anticipation of a tourism boom, Singapore aims to transition from a manpower-driven tourism industry to a productivity-driven sector by removing manual repetitive tasks and duties through automation or process improvements. Such factors along with higher awareness have led to better productivity growth in hotels in Singapore. Hence, even though hotels in Singapore are low in technology adoption, they have high levels of labor productivity and profitability.

Hotels' approach: Maximize profitability and labor productivity

Many hotels in Singapore receive grants as part of the government's effort to create a safety net for businesses. However, such financial support may lead to underlying issues like the lack of initiative to drive process improvement, which may hinder the productivity of hotels in Singapore on an international level and make it difficult to identify productivity gaps.

Hotels' approach: A productivity perspective

The productivity of hotels in Singapore is perceived to be higher in terms of profitability due to better ARR and AOR; many hotels in Singapore enjoy higher occupancy rates than those in other cities. However, despite the government's initiatives to increase productivity, hotels in Singapore lack technology innovation for process improvement. This is factored in by a dependency on low-cost foreign labor and a reliance on government grants. Hotels in Singapore are heavily dependent on foreign labor for operations like front office, housekeeping, and F&B as the country lacks diverse talent. Since foreign workers are available at low wages, hotels in Singapore do not see the benefit of integrating new technologies for process improvement.

Low technology diffusion does not mean lower productivity

Despite STB's efforts, technology diffusion in hotels across all tiers in Singapore is low as compared to other cities. However, hotels in the city are adopting technologies across various spectrums depending on their objectives and tier. They value and identify human capital and speed of execution as the criteria for profitability and productivity. Also, despite the lower rate of technology diffusion, luxury, upscale, and mid-tier hotels in Singapore have a high rate of technology adoption.

Productivity efforts by hotels in Singapore

Across Singapore, conscious efforts have been made to raise productivity levels across luxury, upscale, and particularly mid-tier hotels. For instance, Millennium Hotel has conducted a study in collaboration with the STB to understand productivity trends and industry standards. In contrast, governments in other cities tend to have a reactive approach to productivity as they learn through the success of their counterparts.

Examples of transformation plans

Fairmont Singapore, Crown Plaza, Park Hotel, and Fullerton Singapore are redesigning their systems to drive efficiency and redefine the hospitality experience. The findings listed in the following examples reiterate Singapore's focus on developing talent, reducing idle time, and enhancing overall labor productivity.

TABLE 2

PRODUCTIVITY STRATEGIES.

Hotel	Productivity Transformation
Fairmount Singapore	The Fairmont Improvement and Innovation Programme was rolled out to identify bottlenecks within housekeeping. The hotel reactivated the linen-chute system to reduce the laborious process for housekeeping attendants, allowing them to better utilize their time [1].
Crown Plaza	The hotel maximizes employee productivity through training and upgrading their skill sets enabling them to take on various interdepartmental roles to avoid and reduce lull periods. This enhances overall labor productivity as evident in this study [2].

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Hotel	Productivity Transformation
Park Hotel	Park Hotel initiated a job redesign pilot program to maximize productivity efforts during peak hours. The course, launched in collaboration with major hotel and education associations like Singapore Hotel Association (SHA), National Trade Union Congress (NTUC), and the Employment and Employability Institution (e2i), aims to equip employees with transferrable skills [3].
Fullerton	Under the Smart Fullerton initiatives, the hotel conducted a pilot for the use of e-Compendium tablets to digitalize initiatives and reshape customer touchpoints [4].

STUDY FRAMEWORK

Methodology

1. For this study, data was mainly collected through primary research. The first stage of primary data collection was to create a list of hotels to understand and classify them according to their tier and certain criteria.

2. Hotels were sourced through secondary research, hotel associations, and travel agencies, or directly from their websites.

3. The hotels were classified into different tiers based on pricing and compared across different travel agencies and hotel rates, their ratings, number of rooms, and amenities. The study indicates that across countries most luxury and upscale hotels tend to have executive lounges and spa facilities.

4. After the initial classification, Frost & Sullivan gathered the following information about the hotels from their websites:

    a. Interior design

    b. Types of restaurants available, including those with Michelin-star rating

    c. Sophistication level of their website

    d. Other third-party sources, such as Oyster

To complete the initial findings, Frost & Sullivan consulted a local team of experts to validate the preliminary listing.

Classification of Hotel Tiers

We modeled the definition of hotel tiers for this study in line with the STB's classification of hotels. The table below defines the luxury, upscale, mid-tier, and budget hotel tiers.

TABLE 3

DEFINITION OF HOTEL TIERS.

Tier	Definition
Luxury	Hotels that are predominantly situated in prime locations and/or in historical buildings.
Upscale	Hotels that are generally in prime locations or have boutique positioning in prime or distinctive locations.
Mid-tier	Hotels in the mid-tier segment are mostly located in prime commercial zones or immediate outlying areas.
Budget	These include hotels that are generally located in outlying areas.

Source: Singapore Tourism Board.

The Research Process

Frost & Sullivan worked with internal local experts and external resources to identify respondents with suitable profiles to ensure that the information gathered during the study was relevant to productivity. The respondents include professionals working at the level of general manager, F&B directors, heads of operations, housekeeping, and front office. Table 4 indicates the profile-wise composition and statistics of respondents.

TABLE 4

RESPONDENT PROFILE.

Profile (n-140)	Composition
General manager	32%
Director of finance	24%
Director of front office	11%
Director of operations	8%
Director of sales and marketing	8%
Director of housekeeping	5%
Director of F&B	3%
Others*	9%
Total	100%

* Others may include finance and sales directors

Sample Size

TABLE 5

CITY-WISE BREAK-UP OF RESPONDENT.

Type	Status	Singapore	Bangkok	Kuala Lumpur	Seoul	Taipei	Tokyo	Hong Kong
In-depth interviews	(120/140)	20	20	18	13	20	13	16
Questionnaire#	(140/140)	20	20	20	20	20	20	20

Cities	Count	Overall	Luxury	Upscale	Mid-tier	Budget
Singapore	Quantitative	20	5	5	5	5
	Qualitative	18	5	5	2	5
Bangkok	Quantitative	20	5	5	5	5
	Qualitative	16	5	5	5	1
Taipei	Quantitative	20	5	5	5	5
	Qualitative	15	4	3	3	5
Hong Kong	Quantitative	20	5	5	5	5
	Qualitative	11	1	5	2	3
Kuala Lumpur	Quantitative	20	5	5	5	5
	Qualitative	12	1	4	5	2
Seoul	Quantitative	20	5	5	5	5
	Qualitative	6	4	0	1	1
Tokyo	Quantitative	20	5	5	5	5
	Qualitative	12	5	4	2	0

Note: A detailed cut of the sample by city and tier is provided in the respective city reports.
Due to the outlier effect, responses from InterContinental Grand Seoul Parnas, Marina Bay Sands, and Grand Hyatt Taipei were removed from the calculations.

Working Formulas for Key Hotel and Productivity Metrics

In this study, we measured productivity by analyzing the efficiency, labor productivity, profitability, and utilization rate indicators. The metrics are classified in Table 6.

TABLE 6

TYPE OF INDICATORS.

Type of Indicators	Metrics
Efficiency	Revenue and operating cost per worker
Labor productivity	Value added per worker, employee hours per occupied room, total FTE by city and tier, and utilization rate of outsourced employees
Profitability	ARR and RevPAR
Utilization rate	Gross operating profit per worker
Additional metric collected	AOR
Technology adoption rate	Technology adoption rate by city, tier, department, productivity perception, and cost of investment

TABLE 7

FORMULA FOR HOTEL METRICS.

Hotel Metrics	Formula*
Revenue per worker	Revenue of participating hotels/number of workers (in-house)
Value added per worker	Revenue per worker – operating cost per worker
Operating cost per worker	Operating cost/number of workers (in-house)
Gross operating profit per worker	Revenue of participating hotel – (manpower cost + operating cost)/number of workers (in-house)
ARR	Room revenue/rooms occupied (figures were provided by hotels)
Revenue per available night	Room revenue/rooms available
AOR	Occupied rooms/nights available
Employee hours per occupied room	Total employee hours (total FTE x employee hours)/total occupied rooms
Total FTEs by city and tier	Average FTE by city and tier. FTE is calculated by adding internal and outsourced employees
Utilization rate of outsourced employees	Number of outsourced employees/number of hotels by city or tier
Technology adoption rate by city, tier, and department	Gathered from questions 9 and 10 of Questionnaire Section F
Productivity perception	Gathered from questions 1 to 6 of Questionnaire Section F
Cost of investment	Gathered from question 7 of Questionnaire Section F

* All indicators except ARR and RevPAR were calculated on an annual basis. ARR and RevPAR were calculated on a daily basis.

Tabulation of Raw Data

The following process was followed to ensure the accuracy of the data received in response to the questionnaire prepared by Frost & Sullivan.

1. Data and information were received from the respondents.

2. Data-cleaning process was followed to identify outliers and illogical data. Data above the standard mean have been used as reference points to identify outliers.

3. The second round of data validation was conducted through primary research and reconfirmation with respondents.

4. Secondary research was conducted to determine any potential data inaccuracies.

PROFITABILITY ANALYSIS

The level of productivity is directly correlated to a nation's overall economic success and technological advancement. For the best-in-class hotels, success is engineered by human interactions and service quality. The emphasis may differ according to the tier, but the two constitute the building blocks of success for any hotel. While there has been an uptake of productivity-enhancing measures across the seven cities, many hotels, especially the luxury and upscale hotels, have reservations about implementing new technology tools as they believe it will reduce the level of personal interaction and have a negative impact on customer experience. Productivity, in these cases, acts as a subset to support hotel operations, streamline processes, and reduce any existing idle time caused by repetitive tasks and duties. The main productivity strategies are streamlining the operational process, digitalizing through system integration, and the adoption of machines and robots.

Apart from economic and technological advancements, factors such as the availability of skilled labor, digital literacy, and receptivity of consumers towards modernization play a pivotal role in how fast an industry can transform. With the growing use of technology such as AI, IoT, and many more, hotels have a plethora of technological solutions to choose from. To streamline and certify the types of technology hotels can adopt, a non-profit trade association for hospitality companies and technology innovators Hotel Technology Next Generation (HTNG) was established. The association plays a crucial role in the congregation and standardization of hotel operations across the board, with senior management of leading hotels serving as the steering committee. As compared to domestic hotels, the HTNG has influenced franchises of international hotels across the seven cities to standardize their operational processes.

The study indicates a difference in productivity between cities depending on how technologically advanced they are. For example, productivity improvement is most visible in advanced cities like Hong Kong, Seoul, Singapore, and Tokyo, where speed and efficiency are vital considerations for adopting or integrating new technology tools. The availability of digitally literate talent pools and the respective government's stance towards innovation and productivity have helped boost productivity in these cities. In addition, labor costs in these four cities tend to be higher due to the high cost of living, as compared to developing cities such as Bangkok, Kuala Lumpur, and Taipei.

Singapore has a high level of labor productivity and profitability despite being an exception in terms of technology adoption. Due to the limited availability of local manpower for laborious tasks, hotel managers are increasingly turning to foreign laborers to address market needs. The dependency ratio ceiling has also added to the challenges of hotel managers. This has resulted in a change of strategy, with hotels adopting technology or increasing outsourcing of main hotel functions. Many hotels championed the use of new technology tools as early as 2015 under the STB initiative. While productivity is a hot topic in Singapore, cities like Bangkok, Kuala Lumpur, and Taipei are taking a slower approach to technology adoption due to the lack of talent and availability of digitally-literate skilled workers.

The diffusion effect of productivity spread depends on various factors, including the country's readiness, hotel tier, needs, level of productivity awareness, and technological competency. Considering these factors, productivity growth was highest in developing cities during the past five years, while Singapore witnessed slower growth due to its early entry. It is observed that productivity awareness in Bangkok and Taipei starts from luxury and upscale (predominantly international) hotels due to the need for standardization of procedures and the availability of expertise and resources.

Among different tiers of hotels in Singapore, the upscale and mid-tier hotels have higher productivity. In addition, upscale and mid-tier hotels tend to have more guests during the year, allowing them to leverage economies of scale. Meanwhile, luxury hotels with 250–300 guests prefer to increase human interaction as service quality and customer satisfaction is heavily weighted in their performance index. It is noted that upscale and mid-tier hotels have higher productivity across all seven cities. Increasingly, luxury hotels have also adopted new technologies and increased their outsourcing capabilities. These actions are required to standardize the global operations of international hotel chains and to reduce the workload of the employees. Budget hotels have the lowest productivity levels across all cities as they have relatively smaller operations, which means that tasks and duties can be easily completed by humans instead of technology tools. However, in terms of value added per worker and revenue per worker, budget hotels in Singapore have higher productivity levels than other developing cities.

Delving into the crux of productivity, Frost & Sullivan seeks to understand its role, how it supports the overall mission and business objective of each hotel, and its impact on the industry in terms of job creation and manpower deployment. While productivity is a critical theme, it has varying importance for different cities and hotel tiers. Collectively, it is observed that revenue generation and business sustainability are the main objectives for hotel managers to push for productivity. With these objectives in mind, hotel managers, especially in the luxury and upscale tiers, place high importance on building processes that drive customer satisfaction, customer engagement, and service quality.

Productivity has a different meaning in each city and for each hotel across different tiers. While each manager has their interpretation of productivity, they can be summarized as follows:

1. Revenue generation with minimum resources
    a. Profit maximization by streamlining business processes
    b. Upskill employees to equip them with the necessary skills, retain them, and incentivize them
2. A supporting tool to enhance customer satisfaction by reducing
    a. The lengths of interactions
    b. The rate of errors
    c. Manpower requirements

Comparison of Profitability Indicators at the City Level

The overall profitability indicators, including the percentage change between 2015 and 2019, are presented in Table 8, Overall Profitability Indicators. The numbers in bold indicate a percentage change of more than +/− 15%. Singapore witnessed high productivity growth of 33% (value added per worker) compared to Bangkok and Taipei due to the STB Industry Transformation Plan taken up by the government in 2015 to transform the industry. In comparison, the productivity movement has just started to spread in Bangkok and Taipei. Singapore has a high percentage change during the five years except for gross profit per worker (22%) and operating cost per worker (37%). This indicates positive growth in revenue streams and a growing need to increase resources to serve the increasing demand.

Compared to Bangkok and Taipei, Singapore has a higher penetration of hotels operated under international franchisees due to early globalization, and the growing meetings, incentives, conferences, and events industry. Taking it into account, Singapore has made lots of effort to maintain the reputation of its hospitality industry among tourists. In particular, the Government of Singapore offers subsidies to hotels for their efforts towards raising productivity levels, making it easier for the industry to redesign the hotel blueprint.

Delving into productivity levels, the hotels in Singapore report that any technology which is implemented must fulfill at least three criteria: service quality, efficiency, and accuracy. In contrast, hotels in Bangkok and Taipei indicate cost and capability to use technology as their key concerns.

In terms of profitability, Hong Kong, Seoul, Singapore, and Tokyo exhibited high revenue per worker, value added per worker, AOR, RevPAR, and ARR, indicating higher profitability margins in the developed cities. Bangkok and Taipei have moderately high levels of profit among the three developing cities due to higher ARR and AOR, while Kuala Lumpur has a low AOR and ARR.

Bangkok

Since the revenue is pegged against the indicators, factors like RevPAR, revenue per worker, and revenue fluctuation from 2015 to 2019 have a direct impact on the percentage change. While RevPAR has declined by 19%, the hotels in the city witnessed an increase of 24% in revenue per worker, indicating reduced manpower flow during the five years. This is in line with a 29% positive increment in operating cost per worker. In essence, hotels in Bangkok are reducing their workforce, which may be due to increasing technology adoption among luxury and upscale hotels. According to the Bank of Thailand , the labor productivity index per employee grew from 103.86 in 2014 to 121.98 in 2018. This led to an overall improvement in labor productivity with Bangkok witnessing one of the highest growth levels in value added per worker. It indicates a change in hotel operations through the digital transformation of back-end processes and the use of mobile applications to drive process improvement across hotel operations.

However, Singapore had the lowest growth in value added per worker as the nation started digitalizing operations before 2015, redesigning systems to drive efficiency, establishing platforms and tools to raise awareness of productivity, and much more [5].

Singapore

The percentage change in hotels across Singapore is not as significant as that in Bangkok. The city registered the highest percentage change of 22% for gross operating profit per worker and 37% for operating cost per worker. Growths in the gross operating profit per worker and the operating cost per worker indicate increased revenue, as the hotel industry has seen upward growth of 22% and

37%, respectively, during the last five years. Value added per worker saw a healthy growth of 33% indicating that the government initiatives to improve efficiency and quality of hospitality have led to the growth in productivity.

While the hotels in Singapore have the highest level of productivity across all tiers, their productivity growth has been slow during the last five years despite government initiatives to push the implementation of new technologies since early 2015. Budget hotels in Singapore have the highest productivity growth since they started innovation and adoption of technology much later.

In comparison, despite lower receptivity, hotels in Bangkok and Taipei witnessed higher productivity growth during the period due to the increasing presence of international hotel chains and higher awareness about productivity.

Taipei

The city witnessed a drop in ARR and RevPAR with hotels reporting only a 10% growth in revenue per worker. As reported by Savills Research, this is due to an increase in the inventory of rooms during the past years triggered by an influx of 38 new hotels, predominantly international franchises [6]. Also, the operating cost per worker decreased during the five years as many existing hotels adopted a cost-saving approach to competing in the saturated market and growing dominance of international hotel chains. With the franchisee hotels pushing for higher productivity, the value added per worker went up by 17%. The hotels in Taiwan have lower AOR as the market is highly reactive to geopolitical risk. The existing relationship between Taiwan and China has led to challenges for hotel operations, especially for non-chain hotels.

Kuala Lumpur

Known as the commercial capital of Malaysia, Kuala Lumpur is one of the largest hotel markets in the country and is home to numerous luxury and upscale hotels [7]. However, the profitability of the hotel industry in Kuala Lumpur has been impacted due to the highly competitive market and soft tourism demands. Its ARR of USD121 and AOR of 69% are lower than most cities. This is due to poor market conditions, weakening currency, and market saturation. Due to the city's highly competitive nature, its revenue per worker of USD48,933 is less competitive than other developing cities. To ensure profitability, hotels across the city are reducing operating costs and outsourcing labor (a 75% utilization rate).

Seoul

With the boom of 'K-pop' and as a destination for cosmetic surgery, tourism has emerged as one of the most lucrative markets in South Korea. The hotels in Seoul have performed relatively better in terms of profitability due to the boom in tourism and the flexible business model that allows hotels to operate using a lean-out approach through outsourcing employees and hotel functions. A transition towards services integrated with information technology systems is prevalent across South Korea, as the nation increased its labor wages by 17%. The utilization of technologies like robotics, IoT, and AI is common to pivot from reliance on manpower.

Tokyo

Tokyo continues to perform exceptionally well in the hotel industry due to the boom in the arrival of international tourists. The legalization of casinos in 2016 and continuous efforts by the government to support the industry's growth have resulted in a competitive hotel landscape. According to the Services Producer Price Index released by the Bank of Japan [8], growing demand

and limited supply led to a sharp increase in hotel prices or Average Daily Rate (ADR) after the occupancy rate hit 80%. This explains why Tokyo has the highest ARR among all cities. The hotel industry has benefited from the high demand and ARR pricing strategy.

Hong Kong

The hotel industry in Hong Kong is unique due to its larger domestic hotel chains such as iClub, Eaton Hong Kong, and East Hotel. These mid-tier and budget hotels are mostly situated on the outskirts of the city center, in Tsim Sa Tsui, Wan Chai, and Sheung Wan. Luxury and upscale hotels are mostly situated in Kowloon or Victoria Peak, where more tourist attractions are located. The city has witnessed a boom in tourism during the last five years due to an increase in overnight visitors from neighboring China and Taiwan after the government modified the 'One Visa, Multiple Entry' rule to allow easier entry for permanent residents into Shenzhen [9]. Driven by increasing inbound tourism and consumer confidence due to regional economic growth, the hotel industry in Hong Kong has witnessed high profitability margin of over 80% during the five years. However, the political unrest in 2019 led to poor demands which affected the entire hotel industry.

TABLE 8

OVERALL PROFITABILITY INDICATORS (% CHANGE).

Indicators	Variables	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
ARR	2019 (in USD)	195	132	140	116	179	156	259
	Average (in USD) 2015–2019	199	140	150	121	179	159	231
	% Change between 2015 and 2019	–6	–7	–12	–3	6	–2	39
REVPAR	2019 (in USD)	149	101	115	87	149	111	138
	Average (in USD) 2015–2019	147	118	122	90	142	108	141
	% Change between 2015 and 2019	–1	–19	–11	0	16	10	12
AOR	2019 (in %)	87	80	71	65	79	89	85
	Average (in %) 2015–2019	86	81	71	69	83	86	84
	% Change between 2015 and 2019	2	–2	0	–8	–2	6	2
Annual revenue per worker	2019 (in USD)	170,607	80,930	81,537	59,903	107,687	130,722	111,507
	Average (in USD) 2015–2019	139,903	73,793	77,161	48,933	90,908	109,572	95,297
	% Change between 2015 and 2019	34	24	10	35	24	18	24
Annual value add per worker	2019 (in USD)	114,555	38,111	55,370	37,792	86,961	103,824	73,775
	Average (in USD) 2015–2019	95,674	36,972	51,080	32,461	73,451	89,752	65,548
	% Change between 2015 and 2019	33	19	17	27	26	13	13

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Indicators	Variables	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Annual gross operating profit per worker	2019 (in USD)	66,816	38,827	32,084	39,372	90,316	84,729	66,175
	Average (in USD) 2015–2019	82,995	36,840	28,176	32,359	72,669	70,494	57,073
	% Change between 2015 and 2019	22	18	20	37	20	22	20
Annual operating cost per worker	2019 (in USD)	56,051	42,819	26,167	22,111	20,726	26,898	37,731
	Average (in USD) 2015–2019	44,229	36,820	26,081	16,473	17,457	19,820	29,749
	% Change between 2015 and 2019	37	29	–2	51	14	39	54

Comparison of Profitability Indicators across Cities by Tier (Luxury)

While comparing the indicators for luxury hotels with the overall indicators, we noted a huge disparity in value added per worker between hotels in different cities. While the hotels in Singapore were most profitable on an aggregate level across the seven cities, its luxury hotels performed moderately, ranking behind Bangkok, Seoul, and Tokyo. Hotels in Singapore registered a 13% growth, while those in Bangkok and Taipei clocked 59% and 24% growth, respectively, during the five years. The higher growth in Bangkok and Taipei was due to the growing dominance of international hotels which led to increased productivity and standardization of hotel management processes. Despite the percentage drop in value added per worker during the five years, hotels in Singapore lead the table across the cities, indicating its high level of productivity in the luxury hotel segment.

Hotels in Hong Kong, Seoul, Singapore, and Tokyo continue to enjoy high levels of profitability. Thailand has seen some of the highest profitability in the upscale segment due to low operating costs per worker. A deep dive into the Singapore hotel market indicates that the nation has high levels of profitability due to favorable outcomes of value added per worker and gross operating profit per worker. Similarly, Bangkok and Taipei witnessed a productivity spurt due to an influx of international hotel chains and the growing awareness of productivity. In particular, Bangkok experienced high growth in the operating cost per worker due to an increasing need for digitalizing and automating processes to streamline and enhance productivity. Kuala Lumpur continues to see a low level of profitability due to a low ARR of USD194 and an AOR of 73%.

Comparing operating costs per worker, hotels in Singapore witnessed a marginal increase of 9% during the five years due to growing revenue per worker. Similarly, the gross operating profit per worker went up significantly to 40% during the period, which may be a result of decreasing operating costs. Manpower cost is not considered a factor for the increase in gross profit due to the segment's emphasis on adequate manpower for ensuring customer satisfaction and high experience levels.

The occupancy rate in Bangkok, Singapore, and Taipei dropped below 20% during the past five years. The drop in the occupancy rate may be attributed to increasing ARR in the case of Bangkok and Singapore. Taipei, however, witnessed a drop of 13% in its ARR due to the influx of new hotel chains and heightened geopolitical risk. In Bangkok and Taipei, where political instability is

observed to affect tourism, the luxury market performed relatively well in comparison to upscale hotels. This may be due to the consumer behavior of the higher-income class.

Hong Kong and Tokyo command a higher ARR due to their positioning to capture high-profile guests through their integration of cultural heritage within the hotel infrastructure, whereas luxury hotels in other cities are built for more commercial use. The excess demand and shortfall of supply. enables hotels in Tokyo to increase their prices based on occupancy rates.

In Hong Kong, apart from the strong regional inbound tourism, the dynamics of the hotel industry play a crucial role in the positioning of luxury hotels. Hotels across the tier see distinct differentiation in terms of pricing strategies and service offerings. Many luxury hotels in Hong Kong like The Murray, The Peninsula, and The Langham embed the city's heritage as part of their branding to target exclusive and high-profile guests. The esteemed positioning of Hong Kong enables hotels in the city to command a higher ARR.

Across the board, revenue per worker is relatively high due to higher ARRs and profitability. However, a more noticeable difference is observed in value added per worker, where developed cities display a higher level of value added per worker than developing cities. Operating costs were marginally low across all cities, except in Bangkok due to its higher customer volumes.

TABLE 9

LUXURY PROFITABILITY INDICATORS (% CHANGE).

Indicators	Variables	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
ARR	2019 (in USD)	288	267	199	194	407	256	485
	Average (in USD) 2015–2019	279	262	216	217	414	290	394
	% Change between 2015 and 2019	5	11	–13	3	0	–17	65
RevPAR	2019 (in USD)	216	237	166	142	319	168	196
	Average (in USD) 2015–2019	211	255	180	158	329	166	197
	% Change between 2015 and 2019	12	–10	–14	4	1	3	8
AOR	2019 (in %)	79	76	77	73	70	77	78
	Average (in %) 2015–2019	84	85	81	78	83	78	81
	% Change between 2015 and 2019	–21	–24	–23	–27	–30	–23	–22
Annual revenue per worker	2019 (in USD)	135,251	160,106	88,209	48,313	103,562	136,046	148,264
	Average (in USD) 2015–2019	127,938	122,675	81,779	37,708	106,334	113,585	145,501
	% Change between 2015 and 2019	12	67	20	38	–8	16	1

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Indicators	Variables	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Annual value add per worker	2019 (in USD)	91,800	58,816	59,988	31,940	82,328	112,525	108,629
	Average (in USD) 2015–2019	88,249	47,771	54,407	26,214	87,346	97,071	112,500
	% Change between 2015 and 2019	13	59	24	28	–12	10	–6
Annual gross operating profit per worker	2019 (in USD)	66,255	73,337	36,621	32,214	63,352	109,502	105,870
	Average (in USD) 2015–2019	69,737	60,573	31,145	26,626	70,824	80,599	114,707
	% Change between 2015 and 2019	40	44	35	27	–18	50	–7
Annual operating cost per worker	2019 (in USD)	43,451	101,290	28,221	16,373	21,234	23,521	39,635
	Average (in USD) 2015–2019	39,688	74,904	27,371	11,494	18,988	16,514	33,001
	% Change between 2015 and 2019	9	72	11	64	13	56	31

Comparison of Profitability Indicators across Cities by Tier (Upscale)

Hotels in Singapore have significantly higher profitability than those in other cities with high profitability indicators like revenue per worker, value added per worker, and gross operating profit per worker. Delving into the Singapore market, the upscale sector witnessed some of the strongest growth. Besides, the operating cost per worker also saw an increase of 49% due to growing customer and revenue flows.

Productivity can only be optimized with healthy customer flow to leverage economies of scale. Among the seven cities, healthy revenue flow and customer traffic have allowed the hotels in Singapore to remain competitive in terms of productivity level. The value added per worker in Bangkok has stayed relatively low due to the higher number of employees.

Frost & Sullivan observed a consistent negative trend across all indicators in Taipei, except RevPAR. Geopolitical tension between China and Taiwan has the biggest impact on the upscale market, predominantly the domestic hotel chains, as evident from the declining AOR. These factors and the market volatility have led to lower productivity in Taipei hotels. Similarly, Bangkok experienced political tension due to dissonance during the general election between 2018 and 2019. Compared to Bangkok and Taipei, the political stability and regional position are crucial attributes for a steady flow of tourists in Singapore.

Hong Kong, Seoul, Singapore, and Tokyo continue to thrive in the upscale segment due to higher profitability ratios and occupancy rates. Value added per worker remains the highest in Seoul due to lower FTEs and higher integration of technology, which reduces overall operating expenses. It is also observed that upscale hotels in Seoul have a higher risk appetite than other tiers, as they readily collaborate with new technology to explore ways to enhance innovation and improve

processes. The Seoul City Report included N-bot, iAlive, and e-Housekeeping as examples of the technologies adopted by the hotels in the city. Drawing similar trends across hotels in developed cities, high profitability and productivity are observed due to greater economies of scale, strong foreign currency exchange, and high productivity and technological aptitude.

All cities showed high AOR of 80% and above, except for Bangkok, Kuala Lumpur, and Taipei where hotels across the tiers had low AOR. Besides, varying profitability levels were observed in the three developing cities. Bangkok had the highest profitability, followed by Kuala Lumpur and Taipei, due to its lower operating costs per worker.

Frost & Sullivan observes that developed cities have higher profitability margins across all tiers due to higher labor productivity and technology adoption rates.

TABLE 10

UPSCALE PROFITABILITY INDICATORS (% CHANGE).

Indicators	Variables	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
ARR	2019 (in USD)	254	152	169	175	177	211	275
	Average (in USD) 2015–2019)	263	185	172	193	186	209	283
	% Change between 2015 and 2019	–9	–20	–5	–7	8	2	17
RevPAR	2019 (in USD)	182	85	155	196	86	167	193
	Average (in USD) 2015–2019	177	116	160	178	96	163	204
	% Change between 2015 and 2019	–3	–29	1	24	–11	14	14
AOR	2019 (in %)	89	77	61	58	86	98	90
	Average (in %) 2015–2019	89	79	73	80	88	99	90
	% Change between 2015 and 2019	–1	–1	–14	–39	12	0	–1
Annual revenue per worker	2019 (in USD)	196,728	41,798	67,174	92,587	94,811	243,364	122,972
	Average (in USD) 2015–2019	143,650	43,698	94,608	65,201	73,024	169,644	105,850
	% Change between 2015 and 2019	56	3	–29	74	42	64	31
Annual value add per worker	2019 (in USD)	143,977	13,291	37,156	53,724	90,204	201,244	73,564
	Average (in USD) 2015–2019	104,660	18,683	51,108	38,872	69,678	143,435	66,203
	% Change between 2015 and 2019	59	–22	–18	71	41	69	12

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Indicators	Variables	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Annual gross operating profit per worker	2019 (in USD)	71,825	16,727	27,712	42,626	89,539	179,933	54,824
	Average (in USD) 2015–2019	98,148	17,310	37,230	31,302	68,553	131,283	48,480
	% Change between 2015 and 2019	20	14	–38	67	43	70	17
Annual operating cost per worker	2019 (in USD)	52,751	28,507	30,018	38,862	4,607	42,120	49,408
	Average (in USD) 2015–2019	38,990	25,015	43,500	26,329	3,346	26,210	39,647
	% Change between 2015 and 2019	49	20	–40	78	68	43	76

Comparison of Profitability Indicators across Cities by Tier (Mid-tier)

Despite their focus on efficiency, mid-tier hotels display moderate profitability compared to the luxury and upscale market due to lower ARR. Across all seven cities, hotels in Singapore, despite a 10% drop in ARR, performed better in terms of productivity levels as observed in their value-added and revenue per worker. During the five years, Bangkok and Taipei registered growth in the value added per worker due to increasing awareness of productivity, leading to a decrease in operating costs per worker. Singapore, on the other hand, experienced growth due to an increase in technology investment by mid-tier hotels.

The study reveals that a lot of digitalization and automation of paperwork happened in Bangkok and Taipei during the five years to meet the increasing need for streamlining operations and due to the boom of new technology devices to solve ongoing productivity challenges. Hence, the transition to digital operations during this period may have led to an increase in costs and a decline in value added per worker.

The increase in the inventory of rooms between 2015 and 2017 can be attributed to new hotels and lodging platforms, such as Airbnb. These led to a decline in ARR during the period. Despite the decrease in room rates, the mid-tier market has quickly adapted by maintaining low operating costs. Compared to luxury and upscale hotels, trends are uniform across Singapore and Bangkok, with AOR slightly better in the mid-tier market due to higher demand for affordably-priced hotels. In comparison, Taipei witnessed a 64% occupancy rate due to geopolitical risks that impacted all hotel tiers. Compared to luxury and upscale hotels, mid-tier hotels are observed to have lower profitability due to lower revenue per employee.

The study indicates that hotels in developed cities have a higher value-added per worker. However, hotels in Seoul were an exception due to lower revenue per worker. Standing second after Singapore, hotels in Hong Kong were observed to have high levels of value added per worker, indicating a high level of employee productivity. The adoption of technology and streamlining of operations is prevalent in Hong Kong, especially within the mid-tier and budget sectors since many hotels in these two segments operate as large-scale franchises. Hence, the adoption of new technology-driven processes can be easily implemented to leverage economies of scale. Unlike luxury and

upscale hotels where technology implementation may seem more complex, mid-tier hotels in Hong Kong leverage the knowledge of existing technologies such as the use of iPads for front desk check-in, as an approach to enhance profitability. Overall, mid-tier hotels are known to leverage cost-saving approaches to maintain profitability. Many hotels across the board reported higher utilization of outsourced vendors and adoption of technologies, thereby improving the overall operation process.

TABLE 11

MID-TIER PROFITABILITY INDICATORS (% CHANGE).

Indicators	Variables	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
ARR	2019 (in USD)	139	85	121	94	126	117	139
	Average (in USD) 2015–2019	143	84	131	96	115	113	127
	% Change between 2015 and 2019	–10	3	–12	–13	19	11	16
RevPAR	2019 (in USD)	123	75	84	54	195	75	84
	Average (in USD) 2015–2019	124	74	89	56	139	72	73
	% Change between 2015 and 2019	–5	4	–7	–19	95	11	26
AOR	2019 (in %)	88	88	64	64	73	70	64
	Average (in %) 2015–2019	84	84	61	64	78	71	63
	% Change between 2015 and 2019	7	8	9	2	–8	–6	–6
Annual revenue per worker	2019 (in USD)	163,242	62,248	77,266	72,961	131,604	64,172	95,068
	Average (in USD) 2015–2019	148,112	57,768	67,638	59,771	101,828	55,651	88,794
	% Change between 2015 and 2019	13	8	19	37	43	18	2
Annual value-add per worker	2019 (in USD)	108,270	42,088	55,026	41,578	94,609	41,384	64,990
	Average (in USD) 2015–2019	102,028	38,372	47,366	36,161	73,237	35,084	60,009
	% Change between 2015 and 2019	4	25	24	31	50	22	7

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Indicators	Variables	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Annual gross operating profit per worker	2019 (in USD)	55,626	38,844	24,882	44,831	114,938	31,288	56,571
	Average (in USD) 2015–2019	72,216	36,215	19,555	33,890	84,934	26,249	52,970
	% Change between 2015 and 2019	–6	10	56	81	55	20	5
Annual operating cost per worker	2019 (in USD)	54,972	20,161	22,240	31,383	36,995	22,788	30,078
	Average (in USD) 2015–2019	46,084	19,396	20,272	23,611	28,591	20,567	28,784
	% Change between 2015 and 2019	36	–16	8	47	27	11	–7

Comparison of Profitability Indicators across Cities by Tier (Budget)

Bangkok, Singapore, and Taipei have witnessed positive productivity growth as observed in the value added per worker, gross operating profit per worker, and revenue per worker. While budget hotels have a low inclination towards introducing new technologies, productivity is perceived to be higher due to the cross-deployment and streamlining of tasks and duties to expedite processes.

The budget hotels in Singapore have witnessed growth in the value added per worker compared to other hotel tiers due to slower diffusion and low awareness of productivity needs. Luxury, upscale, and mid-tier hotels may have taken the first-mover advantage with the adoption of automation and digitalization as early as 2013–2015 when these technologies were still at a nascent stage. On the other hand, budget hotels may have started the process at a later stage. Similarly, it is noted that budget hotels only provide basic amenities due to their low pricing strategies. Thus, cost efficiency and speed of completion are important factors to thrive in this segment. Budget hotels in Tokyo, however, still see a higher ARR than the rest of the cities due to a strong currency gain and high occupancy rate. Compared to Singapore with its similar ARR value, hotels in Tokyo lack in terms of revenue per worker due to the higher number of FTEs, which dilutes their overall profit. In terms of profitability, Hong Kong, Singapore, and Taipei witnessed high profitability indicators.

Labor productivity and profitability are relatively high for budget hotels as they tend to operate on smaller scales, allowing tasks and duties to be completed efficiently with less manpower. Process improvement is limited in this market due to the smaller scale of operation and the market positioning. However, like the mid-tier segment, budget hotels in Hong Kong have high productivity due to their larger-scale operations. When compared across all cities, budget hotels in Singapore emerged as the leader for all indicators, demonstrating that they are more productive than the hotels in Bangkok and Taipei. Again, the AOR for hotels in Bangkok and Singapore show a lower percentage change while the hotels in Taipei witnessed a higher percentage change of 12% due to the ongoing geopolitical risks. Further, budget hotels in Hong Kong, Seoul, Singapore, and Tokyo are observed to have high AOR as it is more affordable for tourist from developing nations.

TABLE 12

BUDGET PROFITABILITY INDICATORS (% CHANGE).

Indicators	Variables	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
ARR	2019 (in USD)	101	41	57	19	51	61	91
	Average (in USD) 2015–2019	94	38	55	19	52	59	91
	% Change between 2015 and 2019	11	11	9	0	18	7	9
RevPAR	2019 (in USD)	75	32	53	12	32	47	66
	Average (in USD) 2015–2019	66	29	48	13	38	45	78
	% Change between 2015 and 2019	11	10	15	–3	–7	12	–0
AOR	2019 (in %)	82	80	75	58	85	81	96
	Average (in %) 2015–2019	79	79	72	59	90	65	96
	% Change between 2015 and 2019	2	0	12	–2	–7	43	–1
Annual revenue per worker	2019 (in USD)	93,422	35,310	64,347	28,972	89,855	73,868	35,397
	Average (in USD) 2015–2019	73,388	33,541	57,286	30,035	56,655	73,744	24,791
	% Change between 2015 and 2019	52	15	6	–2	127	–5	48
Annual value-add per worker	2019 (in USD)	54,933	23,438	31,618	33,068	86,437	27,646	24,613
	Average (in USD) 2015–2019	42,483	21,099	25,104	34,657	43,421	26,712	15,194
	% Change between 2015 and 2019	60	27	43	–4	187	–1	88
Annual gross operating profit per worker	2019 (in USD)	49,139	23,438	31,618	33,068	86,437	27,646	24,613
	Average (in USD) 2015–2019	54,933	21,099	25,104	34,657	43,421	26,712	15,194
	% Change between 2015 and 2019	43	27	43	–4	187	–1	88
Annual operating cost per worker	2019 (in USD)	40,217	5,732	26,140	2,935	12,225	43,266	9,973
	Average (in USD) 2015–2019	30,425	7,227	25,696	2,846	12,650	45,825	6,496
	% Change between 2015 and 2019	43	–30	–15	9	–28	–15	55

LABOR PRODUCTIVITY ANALYSIS

Comparison of Full-time Equivalent (FTE) at the City Level

FTE calculations include the number of full-time employees working in a hotel and the number of outsourced employees. Study results indicate that the majority of hotels in Kuala Lumpur, Seoul, Singapore, and Tokyo have engaged external vendors to support overall hotel operations. To ensure a more accurate comparison between cities, Frost & Sullivan included both internal employees and outsourced employees while calculating the total number of FTE employees.

TABLE 13

OVERALL FTEs.

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	218	306	168	246	239	150	181
2016	215	309	166	231	246	155	176
2017	148	296	139	206	238	111	165
2018	185	295	149	239	282	157	199
2019	165	254	152	226	246	126	175
Growth between 2015 and 2019	–24%	–17%	–9%	–8%	3%	–16%	–3%
Average	186	292	155	230	250	140	179

Table 13 depicts the average number of overall FTEs working in each city. The study indicates that hotels in Seoul, Singapore, Taipei, and Tokyo have the lowest number of FTE employees.

Comparison of FTE across Cities by Tier

Luxury hotels

TABLE 14

OVERALL FTEs (LUXURY).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	237	456	304	450	338	543	130
2016	242	460	298	475	334	545	127
2017	246	418	289	480	363	547	156
2018	238	423	256	506	401	425	157
2019	248	361	269	439	389	430	179
Growth between 2015 and 2019	–24%	–17%	–9%	–8%	3%	–16%	–3%
Average	242	424	283	470	365	498	150

Table 14 analyzes the total number of FTEs working in luxury hotels across the seven cities. Singapore, Taipei, and Tokyo have the lowest number of employees working in luxury hotels due to fewer rooms within this tier. Hence, less manpower is required to maintain the operations of these luxury hotels. In contrast, Bangkok, Kuala Lumpur, and Seoul have a higher number of FTEs due to large-scale operations in terms of the number of rooms. Hotels in the luxury segment of these cities deploy more FTEs since they give greater priority to customer service and experience.

TABLE 15

NUMBER OF ROOMS (LUXURY).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Average number of rooms per city	299	274	195	382	414	234	337
Average number of rooms (luxury segment)	265	314	312	485	382	527	254

Upscale hotels

TABLE 16

OVERALL FTEs (UPSCALE).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	487	492	70	358	310	140	379
2016	501	484	69	353	338	151	306
2017	497	331	67	375	357	147	306
2018	493	320	104	294	359	163	336
2019	344	268	135	302	295	144	332
Growth between 2015 and 2019	–29%	–46%	93%	–16%	–5%	3%	–12%
Average	464	379	89	336	332	149	332

TABLE 17

NUMBER OF ROOMS (UPSCALE).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total number of rooms per city	299	274	195	382	414	234	337
Average number of Rooms (upscale segment)	486	340	145	517	566	361	671

Delving into the upscale hotels, Seoul and Taipei have the lowest number of FTEs working in this segment. Similarly, as indicated in Table 17, the number of upscale rooms in Taipei is much lower as compared to the other cities due to a higher rate of technology adoption and a smaller scale of operation, respectively. Despite having more rooms than the luxury tier, the upscale hotels in Hong Kong and Kuala Lumpur employ fewer FTEs due to a difference in the quality of service between the two tiers.

Mid-tier hotels

TABLE 18

OVERALL FTEs (MID-TIER).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	201	194	234	180	276	101	109
2016	190	195	235	148	284	108	115
2017	176	195	218	155	307	116	130
2018	178	197	214	168	323	125	141
2019	173	195	211	166	318	131	146
Growth between 2015 and 2019	–14%	0%	–10%	–8%	15%	29%	34%
Average	184	195	222	164	302	116	128

Table 18, Overall FTEs (Mid-tier), illustrates that fewer FTEs are present in the mid-tier segment as compared to the luxury and upscale hotels due to a difference in the quality of service. Within the mid-tier segment, Kuala Lumpur, Seoul, and Tokyo have the lowest FTEs. Similarly, Seoul and Tokyo have significantly fewer rooms in comparison to the other cities. Despite having more rooms, hotels in Kuala Lumpur utilize fewer FTEs due to lower profitability.

TABLE 19

NUMBER OF ROOMS (MID-TIER).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Average number of rooms per city	299	274	195	382	414	234	337
Average number of rooms (mid-tier)	400	261	238	420	459	164	243

Budget hotels

TABLE 20

OVERALL FTEs (BUDGET).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	34	161	28	81	65	22	146
2016	32	157	28	81	65	23	154
2017	31	150	28	81	69	22	168
2018	26	143	22	81	70	24	164
2019	25	118	22	81	61	27	149
Growth between 2015 and 2019	–26%	–26%	–24%	0%	–7%	20%	2%
Average	30	146	26	81	66	24	156

TABLE 21

NUMBER OF ROOMS (BUDGET).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Average number of rooms per city	299	274	195	382	414	234	337
Average number of rooms (budget segment)	84	190	61	120	242	52	213

As compared to luxury, upscale, and mid-tier hotels, budget hotels have fewer FTEs due to their smaller scale of operation, as illustrated in Table 21. Unlike luxury, upscale, and mid-tier hotels, budget hotels leverage a lean and fast-turnaround model. As such, the ARR levels tend to be based at the lower end of the price range. Seoul, Singapore, and Taipei utilize fewer FTEs because their budget hotels have fewer rooms than other cities.

Comparison of FTE across Cities by Function (Front Office)

TABLE 22

FTEs IN FRONT OFFICE FUNCTIONS (OVERALL).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	28	32	21	34	25	17	25
2016	29	32	21	32	25	17	23
2017	27	30	19	33	27	17	26
2018	25	30	18	32	28	19	27
2019	24	31	19	31	26	20	27
Growth between 2015 and 2019	–13%	–4%	–8%	–8%	3%	18%	10%
Average	27	31	20	33	26	18	25

As seen in Table 22, Seoul, Taipei, Tokyo, and Hong Kong have fewer FTEs in front-office functions. This is because hotels in these cities have a lesser number of FTEs than the other three cities.

Comparison of FTE across Cities by Tier (Front Office)

Luxury hotels

TABLE 23

FTEs IN FRONT OFFICE FUNCTIONS (LUXURY).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	35	52	43	61	39	39	14
2016	36	53	43	66	36	37	13
2017	35	44	40	70	38	40	19
2018	31	46	38	69	38	39	19
2019	32	51	39	57	39	38	20
Growth between 2015 and 2019	–7%	–1%	–10%	–6%	–1%	–3%	39%
Average	34	49	41	64	38	38	17

The study results for the luxury hotel segment show that developed cities like Hong Kong, Seoul, Singapore, and Tokyo have much lower FTEs for FO functions. This is due to the higher adoption level of technologies such as IoT, AI, and Machine Learning (ML) solutions, which help reduce manpower and expedite operating processes. In contrast, luxury hotels in Bangkok, Kuala Lumpur, and Taipei have a higher number of FTEs handling FO due to higher priority on human interaction and low levels of technology adoption.

Upscale hotels

TABLE 24

FTEs IN FRONT OFFICE FUNCTIONS (UPSCALE).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40	50	14	50	23	18	55
2016	42	49	13	50	24	19	41
2017	33	47	13	50	25	18	44
2018	34	46	14	38	29	18	47
2019	33	37	18	38	23	18	47
Growth between 2015 and 2019	–18%	–25%	26%	–25%	0%	2%	–13%
Average	36	46	14	45	25	18	47

Data from Table 24 reflects that Bangkok, Kuala Lumpur, and Tokyo have the highest number of FTEs by FO function. This is due to the high number of rooms in upscale hotels, which require a more extensive deployment of manpower for attending guests. Five cities, except Taipei and Seoul, registered a decline in the number of FO employees, indicating process improvement that allows for the use of lesser manpower.

Mid-tier hotels

TABLE 25

FTEs IN FRONT OFFICE FUNCTIONS (MID-TIER).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	29	22	14	28	31	17	20
2016	30	22	13	22	33	18	20
2017	28	22	14	24	34	20	23
2018	27	23	14	25	35	22	23
2019	25	22	14	26	35	25	26
Growth between 2015 and 2019	–12%	2%	2%	–10%	12%	43%	33%
Average	28	22	14	25	33	20	22

The number of front office FTEs is low in mid-tier hotels across all cities due to their emphasis on the optimization of manpower and cost-efficiency. Singapore and Kuala Lumpur witnessed

productivity improvement with lesser manpower while Bangkok and Taipei saw a stable flow of FTEs in FO functions during the five years, with little to no change. In Seoul and Tokyo hotels, the number of Front Office FTEs has increased due to the growing customer base and operational size.

Budget hotels

TABLE 26

FTEs IN FRONT OFFICE FUNCTIONS (BUDGET).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	9	11	7	8	11	4	16
2016	9	11	7	8	11	4	17
2017	8	12	7	8	11	4	18
2018	7	13	6	9	11	4	19
2019	8	12	7	9	10	5	15
Growth between 2015 and 2019	–10%	6%	–6%	2%	–4%	18%	–4%
Average	8	12	7	8	11	4	17

The number of front office FTEs across all tiers remains the lowest among budget hotels due to the small scale of operation and their profitability model. Cost efficiency and manpower reduction through cross-deployment are the key strategies of budget hotels.

Comparison of FTE across Cities by Function (Housekeeping)

TABLE 27

FTEs IN HOUSEKEEPING FUNCTIONS (OVERALL).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	39	63	38	58	66	34	39
2016	39	64	42	55	67	36	38
2017	33	58	22	38	50	18	27
2018	35	59	40	56	81	37	42
2019	34	51	40	55	71	37	41
Growth between 2015 and 2019	–13%	–19%	4%	–7%	8%	10%	7%
Average	36	59	36	52	67	33	37

The number of employees deployed in housekeeping is significantly higher than in front office functions as the tasks executed in this department are labor-intensive and require a high level of awareness about hygiene and cleanliness. It is observed that hotels in Seoul, Singapore, and Tokyo have a lower number of FTEs for housekeeping. Hotels in these cities leverage technology tools such as e-Housekeeping, power-delivery-assisted robots, and other IoT solutions to reduce the need for additional labor. Interestingly, despite a high level of technology adoption, hotels in Hong Kong have one of the highest numbers of FTEs for housekeeping since many of these employees are retirees or housewives working on a part-time basis.

Comparison of FTE across Cities by Tier (Housekeeping)

Luxury hotels

TABLE 28

FTEs IN HOUSEKEEPING FUNCTIONS (LUXURY).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	49	94	88	97	75	101	30
2016	51	94	98	103	73	105	28
2017	46	71	43	73	60	27	26
2018	42	79	105	106	92	82	40
2019	42	67	105	88	91	82	44
Growth between 2015 and 2019	–15%	–29%	19%	–9%	21%	–18%	44%
Average	46	81	88	93	78	79	34

Within the luxury tier, hotels in Singapore and Tokyo have the lowest number of FTEs across housekeeping functions. Since Singapore has a relatively lesser number of rooms in the luxury tier as compared to other cities, except Tokyo, luxury hotels in the city require fewer FTEs for housekeeping. In contrast, Tokyo has a 50% utilization rate of outsourced vendors and is high in the adoption of technologies like IoT, robotics, e-Housekeeping, Robotic Process Automation (RPA), AI, and housekeeping power-assisted robots. Nonetheless, respondents from hotels in Tokyo indicate that a lack of process improvement has caused process deficiency due to stringent quality control, which negatively affects productivity. Managers have also pointed out that it is important to strike a balance between efficiency and quality assurance to ensure that time and resources can be used accordingly.

Upscale hotels

TABLE 29

FTEs IN HOUSEKEEPING FUNCTIONS (UPSCALE).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	58	106	14	99	88	31	45
2016	57	107	15	93	92	37	39
2017	36	104	13	60	74	16	25
2018	46	110	12	73	101	41	37
2019	44	78	19	76	72	36	35
Growth between 2015 and 2019	–24%	–27%	40%	–23%	–18%	16%	–21%
Average	48	101	14	80	85	32	36

In the upscale hotel segment, Seoul, Taipei, and Tokyo have the lowest number of FTEs in housekeeping. These low numbers can be factored in by the smaller scale of operation in Taipei,

and higher technology adoption. Hong Kong and Kuala Lumpur sustain a high level of FTEs in housekeeping functions due to the higher availability of part-time labor and low wages.

Mid-tier hotels

TABLE 30

FTEs IN HOUSEKEEPING FUNCTIONS (MID-TIER).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40	38	30	45	90	30	41
2016	39	39	31	38	93	31	41
2017	35	36	22	27	62	27	34
2018	40	39	29	46	114	37	44
2019	43	39	29	45	109	38	46
Growth between 2015 and 2019	7%	5%	–4%	0%	21%	26%	12%
Average	39	38	28	40	94	33	41

Mid-tier hotels deploy a lower number of housekeeping employees as they focus on productivity and cost-efficiency. In addition, the high utilization rate of outsourced employees and the rate of technology adoption have improved overall productivity across the board. Hong Kong continues to see a high level of FTEs in housekeeping and landscaping functions; many hotels in the city use a pool of part-time employees as a way to maintain manpower costs.

Budget hotels

TABLE 31

FTEs IN HOUSEKEEPING FUNCTIONS (BUDGET).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	11	24	10	16	16	7	40
2016	11	23	10	16	17	8	41
2017	9	23	10	12	10	7	23
2018	9	21	7	17	19	8	45
2019	9	18	7	17	15	10	40
Growth between 2015 and 2019	–22%	–26%	–26%	1%	–5%	41%	2%
Average	10	22	9	16	16	8	38

As seen in Table 31, budget hotels employ the lowest number of FTEs in housekeeping functions as compared to other tiers because these hotels are operated on a smaller scale and employees are required to take up more than one role to maximize their utilization rate. However, hotels in Tokyo have the highest number of FTEs in housekeeping across all cities due to their larger scale of operation in this segment.

Comparison of FTE across Cities by Function (Food and Beverage)

TABLE 32

FTEs IN FOOD AND BEVERAGE FUNCTIONS (OVERALL).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	93	99	62	62	86	42	53
2016	90	99	60	64	88	42	51
2017	77	94	54	63	90	39	55
2018	71	93	55	57	101	44	54
2019	69	77	69	54	91	43	54
Growth between 2015 and 2019	–27%	–22%	11%	–12%	6%	3%	3%
Average	80	92	60	60	91	42	53

Comparison of FTE across Cities by Tier (Food and Beverage)

Overall, the F&B department sees the highest number of FTEs across all three hotel functions of the front office, housekeeping, and F&B. Seoul and Tokyo have the highest productivity levels due to their high technology adoption rates. Technology tools such as IoT, AI, table queue management, and power-assisted delivery are integrated into F&B setups for a seamless transition between the front-of-house and back-of-house operations. Hotels in Singapore have the highest number of FTEs in F&B as a majority of their service crew are foreign workers, largely from China, the Philippines, and Malaysia. As F&B functions orientate towards human interaction, operational processes are still driven largely by manpower for front-of-house services. Technology adoption is only apt for back-of-house operations to streamline information flow from supply management to order taking.

Luxury hotels

TABLE 33

FTEs IN FOOD AND BEVERAGE FUNCTIONS (LUXURY).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	93	126	62	62	86	42	53
2016	90	130	60	64	88	42	51
2017	77	117	54	63	90	39	55
2018	71	119	55	57	101	44	54
2019	69	100	69	54	91	43	54
Growth between 2015 and 2019	–27%	–21%	11%	–12%	6%	3%	3%
Average	80	118	60	60	91	42	53

In the luxury tier, hotels in Seoul and Tokyo continue to see high levels of productivity with fewer employees deployed in their F&B segment. Apart from technology adoption, a lower number of F&B covers[1] to employee ratio is observed in these two cities. Bangkok and Hong Kong have a higher number of FTEs in F&B functions due to the high volume of customers in this segment.

[1] Cover refers to a diner who eats or a meal that is served (number of diners from F&B). [adapted from the Questionnaire]

Upscale hotels

TABLE 34

FTEs IN FOOD AND BEVERAGE FUNCTIONS (UPSCALE).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	113	158	21	69	98	43	137
2016	103	159	20	69	105	43	109
2017	71	158	17	70	107	42	115
2018	68	155	18	55	114	50	111
2019	58	104	65	61	85	41	112
Growth between 2015 and 2019	–48%	–35%	210%	–12%	–13%	–5%	–18%
Average	83	147	28	65	102	44	117

In the upscale segment, hotels in Seoul and Taipei have a lesser number of FTEs in F&B functions due to the low volume of customers in this segment. However, Taipei registered a 210% increase in FTEs in the F&B function between 2015 and 2019 as the Hilton experienced a surge in F&B covers in 2019 with the opening of new hotel restaurants. Hong Kong, Singapore, Taipei, and Tokyo experienced a higher volume of upscale hotel diners creating a demand for more FTEs in this segment. Hong Kong has a high level of technology adoption in the hotel F&B segment but these solutions are largely systems adopted to support back-of-house operations like online reservation and ordering, table queue management, and crowd management.

Mid-tier hotels

TABLE 35

FTEs IN FOOD AND BEVERAGE FUNCTIONS (MID-TIER).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	108	55	86	36	83	26	29
2016	96	57	86	37	87	28	31
2017	77	57	71	36	88	28	31
2018	79	56	70	31	95	29	36
2019	73	58	75	31	98	30	35
Growth between 2015 and 2019	–32%	5%	–12%	–15%	18%	16%	21%
Average	87	57	77	34	90	28	32

The mid-tier segment has similarly low numbers for FTEs in F&B functions as seen in the upscale segment since mid-tier hotels prioritize cost-efficiency. Kuala Lumpur, Seoul, and Tokyo witnessed the lowest number of FTEs due to their lower number of F&B covers.

Budget hotels

TABLE 36

FTEs IN FOOD AND BEVERAGE FUNCTIONS (BUDGET).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	6	56	12	18	28	9	41
2016	6	47	12	18	28	9	44
2017	6	46	12	18	29	8	47
2018	4	46	12	18	29	8	45
2019	4	35	17	18	26	9	41
Growth between 2015 and 2019	–33%	–37%	42%	0%	–7%	–2%	0%
Average	5	46	13	18	28	8	44

The budget hotel segment continues to exhibit a low level of FTEs as a majority of these hotels do not have an F&B department.

Comparison of Outsource Utilization Rate at the City Level

TABLE 37

UTILIZATION RATE OF OUTSOURCED EMPLOYEES (OVERALL).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	45%	40%	33%	68%	70%	50%	70%
2016	45%	40%	29%	77%	75%	55%	74%
2017	50%	50%	29%	77%	75%	55%	74%
2018	60%	50%	29%	77%	75%	60%	74%
2019	70%	55%	43%	77%	75%	60%	74%
Growth between 2015 and 2019	56%	38%	29%	13%	7%	20%	6%
Average	54%	47%	32%	75%	74%	56%	73%

Hotels in Hong Kong, Kuala Lumpur, Seoul, and Tokyo have the highest utilization rate of outsourced employees. While Hong Kong, Seoul, and Tokyo have more outsourced employees due to high labor costs, Kuala Lumpur adopts a different business model to leverage high variable costs due to the low profitability margin. From 2017 onwards, Singapore witnessed a spike in the number of outsourced workers due to less availability of foreign manpower after the change in the country's manpower policies.

Comparison of Outsource Utilization Rate across Cities by Tier

Luxury hotels

TABLE 38

UTILIZATION RATE OF OUTSOURCED EMPLOYEES (LUXURY).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	60%	40%	50%	80%	80%	40%	50%
2016	60%	40%	33%	80%	80%	60%	50%
2017	60%	60%	33%	80%	80%	60%	50%
2018	80%	60%	33%	80%	80%	80%	50%
2019	80%	60%	33%	80%	80%	80%	50%
Growth between 2015 and 2019	33%	50%	–33%	0%	0%	100%	0%
Average	68%	52%	37%	80%	80%	64%	50%

Luxury hotels in Hong Kong, Kuala Lumpur, Seoul, Singapore, and Tokyo have to utilize outsourced employees at a higher level. Singapore has a higher utilization rate in the segment as compared to its overall average [see Table 37. Utilization Rate of Outsourced Employees (Overall)]; an overall growth of 10% was observed from 2017 to 2018. The adoption of outsourced employees is prevalent in upscale and mid-tier hotels because they operate at a higher capacity, and fast turnaround and execution are required to ensure that all customers are attended to. In comparison, Luxury hotels experience slower adoption of outsourced employees as they house fewer guests. Hence, due to lower capacity, the utilization rate of outsourced employees in luxury hotels stands at an average of 62% across all cities. However, luxury hotels in Singapore are witnessing a higher utilization rate of outsourced employees following the country's decision to tighten its dependency ratio on foreign workers.

Upscale hotels

TABLE 39

UTILIZATION RATE OF OUTSOURCED EMPLOYEES (UPSCALE).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40%	40%	20%	60%	40%	60%	60%
2016	40%	40%	20%	60%	60%	60%	80%
2017	40%	40%	20%	60%	60%	60%	80%
2018	40%	40%	20%	60%	60%	60%	80%
2019	80%	40%	40%	60%	40%	60%	80%
Growth between 2015 and 2019	100%	0%	100%	0%	0%	0%	33%
Average	48%	40%	24%	60%	52%	60%	76%

Analysis of the data for upscale hotels indicates that Kuala Lumpur, Seoul, and Tokyo have the highest utilization rate of outsourced employees as compared to hotels in the other four cities. It also reveals that Hong Kong, Seoul, and Tokyo rely on outsourced employees to increase the variable cost resulting from the high cost of local labor. In Kuala Lumpur, the low level of AOR has led to

poor profitability margins, which were caused by poor market conditions and market saturation. Moreover, lower AOR has also led to an increase in employee idle time. Hence, to ensure profitability and productivity, many hotels leverage outsourced vendors to balance their manpower deployment.

The research shows an upward shift towards the use of outsourced vendors in Singapore and Taipei. As explained earlier, Singapore is shifting its business model to reduce reliance on foreign workers due to the introduction of a tightened foreign dependency ratio, which has negatively impacted productivity growth. Meanwhile, Taipei has shifted its business model to incorporate more outsourced employees in response to the sudden drop in visitors due to political unrest.

Mid-tier hotels

TABLE 40

UTILIZATION RATE OF OUTSOURCED EMPLOYEES (MID-TIER).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	60%	60%	60%	71%	100%	80%	80%
2016	60%	60%	60%	100%	100%	80%	80%
2017	80%	60%	60%	100%	100%	80%	80%
2018	80%	60%	60%	100%	100%	80%	80%
2019	80%	60%	60%	100%	100%	80%	80%
Growth between 2015 and 2019	33%	0%	0%	40%	0%	0%	0%
Average	72%	60%	60%	94%	100%	80%	80%

A higher utilization rate for outsourced employees is seen in the mid-tier hotel segment as compared to all other hotel tiers. This is because most mid-tier hotels focus on low-cost operations and strategies to maximize overall profitability. Similarly, the trend of shifting to outsourced labor was evident from 2016 to 2017 in Singapore. Mid-tier hotels in Kuala Lumpur have increased their use of outsourced employees reflecting a growth of 40% due to dwindling profit margins contributed by low ARR. Hong Kong, Seoul, and Tokyo exhibit consistent trends across luxury, upscale, and mid-tier hotel segments.

Budget hotels

TABLE 41

UTILIZATION RATE OF OUTSOURCED EMPLOYEES (BUDGET).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	20%	20%	0%	60%	60%	20%	100%
2016	20%	20%	0%	60%	60%	20%	100%
2017	20%	40%	0%	60%	60%	20%	100%
2018	40%	40%	0%	60%	60%	20%	100%
2019	40%	60%	40%	60%	80%	20%	100%
Growth between 2015 and 2019	100%	200%	400%	0%	33%	0%	0%
Average	28%	36%	8%	60%	64%	20%	100%

The budget hotels have a significantly lower utilization rate of outsourced employees in comparison to the other three tiers (luxury, upscale and mid-tier). Low adoption of outsourcing is seen among budget hotels in Bangkok, Seoul, Singapore, and Taipei as most of these hotels operate on a smaller scale. However, Hong Kong, Kuala Lumpur, and Tokyo have relatively higher utilization rates of outsourced employees among the budget hotels.

Comparison of Outsource Utilization Rate across Cities by Functions (Front Office)

TABLE 42

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR FRONT OFFICE FUNCTIONS (OVERALL).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	30%	20%	10%	50%	55%	35%	70%
2016	30%	20%	10%	50%	55%	40%	70%
2017	30%	25%	10%	50%	55%	40%	70%
2018	30%	25%	10%	50%	55%	40%	65%
2019	30%	30%	15%	50%	55%	40%	70%
Growth between 2015 and 2019	0%	50%	50%	0%	0%	14%	0%
Average	30%	24%	11%	50%	55%	39%	69%

Overall hotels have a low utilization rate of outsourced employees at the FO. This is primarily because the FO functions are essential to the branding and reputation of the hotel. The service quality and customer contact at the front office embodies the vision and mission of a hotel. Hence, employees' training and standardization of services are crucial in terms of value proposition and positioning. As a result, many hotels prefer to directly recruit and train their FO employees to best align standards and expectations. Among the seven cities, Hong Kong, Kuala Lumpur, Seoul, and Tokyo have higher outsourcing utilization rates due to high labor costs and low availability of the labor pool.

Luxury hotels

TABLE 43

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR FRONT OFFICE FUNCTIONS (LUXURY).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40%	40%	17%	80%	60%	20%	50%
2016	40%	40%	17%	80%	60%	40%	50%
2017	40%	60%	17%	80%	60%	40%	50%
2018	40%	60%	17%	80%	60%	40%	50%
2019	40%	60%	17%	80%	60%	40%	50%
Growth between 2015 and 2019	0%	50%	0%	0%	0%	100%	0%
Average	40%	52%	17%	80%	60%	36%	50%

Analysis of the luxury tier reveals that hotels in Bangkok, Hong Kong, Kuala Lumpur, and Tokyo have the highest rate of utilization of outsourced employees at the FO. Seoul, on the other hand,

demonstrated the lowest utilization rate in 2015 but has started to shift its focus toward the adoption of outsourced vendors for FO functions. The utilization rates of outsourced employees at FO for Singapore and Taipei remain between low to moderate.

Upscale hotels

TABLE 44

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR FRONT OFFICE FUNCTIONS (UPSCALE).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	20%	0%	20%	60%	20%	60%	60%
2016	20%	0%	20%	60%	20%	60%	60%
2017	20%	0%	20%	60%	20%	60%	60%
2018	20%	0%	20%	60%	20%	60%	40%
2019	20%	0%	20%	60%	0%	60%	60%
Growth between 2015 and 2019	0%	0%	0%	0%	–100%	0%	0%
Average	20%	0%	20%	60%	16%	60%	56%

The utilization of outsourced employees for FO functions remains consistent across upscale hotels in Kuala Lumpur, Seoul, and Tokyo. Across all tiers, hotels in Hong Kong have a higher utilization rate on the number of outsourced employees, except in the upscale segment. This may be because a higher proportion of domestic hotels affect the strategies adopted. Unlike international chains of hotels, domestic hotels are often managed privately or are family-owned. Hence, such hotels may adopt different strategic plans and management impacting the overall strategies and planning. Upscale hotels in Seoul, on the other hand, have higher utilization rates as they move towards a lean model to reduce fixed costs due to the high wages. Shifting towards a high variable cost allows hotels to have the flexibility to modify timesheets and reallocate manpower without having to pay full-time employee costs as part-time employees are often paid on an hourly basis.

Mid-tier hotels

TABLE 45

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR FRONT OFFICE FUNCTIONS (MID-TIER).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40%	40%	0%	29%	80%	60%	40%
2016	40%	40%	0%	29%	80%	60%	40%
2017	40%	40%	0%	29%	80%	60%	40%
2018	40%	40%	0%	29%	80%	60%	40%
2019	40%	40%	0%	29%	80%	60%	40%
Growth between 2015 and 2019	0%	0%	0%	0%	0%	0%	0%
Average	40%	40%	0%	29%	80%	60%	40%

In the mid-tier space, hotels in Hong Kong and Seoul continuously exhibit high utilization rates of outsourced FO employees at 80% and 60%, respectively. Kuala Lumpur has the lowest utilization rate as most mid-tier hotels in this city are domestic players. Hence, due to a lack of economies of scale, these small domestic hotels may have relatively less preference for working with outsourced vendors. Similarly, Taipei has zero utilization of outsourced vendors due to the higher presence of domestic hotels in this tier. Domestic hotels are seen to be less productive as most of them are family-owned businesses with limited hospitality expertise. Mid-tier hotels in Seoul, on the other hand, continue to see higher utilization of outsourced employees in FO functions due to high labor costs.

Budget hotels

TABLE 46

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR FRONT OFFICE FUNCTIONS (BUDGET).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	20%	0%	0%	40%	60%	0%	100%
2016	20%	0%	0%	40%	60%	0%	100%
2017	20%	0%	0%	40%	60%	0%	100%
2018	20%	0%	0%	40%	60%	0%	100%
2019	20%	20%	20%	40%	80%	0%	100%
Growth between 2015 and 2019	0%	100%	0%	0%	–33%	0%	0%
Average	20%	4%	4%	40%	64%	0%	100%

Similar to the mid-tier segment, budget hotels across the seven cities have lower utilization of outsourced employees for FO functions. However, hotels in Hong Kong and Tokyo continue to have the highest utilization of outsourced vendors among all cities in this tier. The use of outsourced FO employees is lowest in Taipei, Bangkok, and Singapore as operational tasks for budget hotels are relatively simple and basic. Like in the mid-tier, budget hotels in Tokyo continue to make high use of outsourced FO employees due to their large-scale operations. In contrast, Seoul has zero utilization of outsourced employees in FO as city hotels in the budget segment operate on a much smaller scale with an average of 52 rooms.

Comparison of Outsource Utilization Rate across Cities by Functions (Housekeeping)

TABLE 47

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR HOUSEKEEPING FUNCTIONS (OVERALL).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	45%	40%	24%	64%	65%	45%	61%
2016	45%	35%	24%	73%	70%	50%	65%
2017	50%	45%	24%	73%	70%	50%	65%
2018	55%	50%	24%	73%	70%	55%	65%
2019	70%	50%	33%	73%	70%	55%	65%
Growth between 2015 and 2019	56%	25%	40%	14%	8%	22%	7%
Average	53%	44%	26%	71%	69%	51%	64%

The utilization rate for outsourced functions of housekeeping is much higher than any other hotel functions as these tasks are easy to perform. Overall, hotels in Hong Kong, Kuala Lumpur, and Tokyo have the highest outsourcing utilization rates of 64% and above . Hotels in Singapore experienced a growth of 56% between 2015 and 2019 as they changed their business model to reduce reliance on foreign workers. A hotel's use of outsourced vendors for housekeeping functions is highly dependent on its occupancy rate and the volume of customers. The drop in utilization of housekeeping vendors in Hong Kong and Bangkok happened during the years of political unrest.

Luxury hotels

TABLE 48

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR HOUSEKEEPING FUNCTIONS (LUXURY).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	60%	60%	17%	80%	100%	40%	50%
2016	60%	40%	17%	80%	100%	60%	50%
2017	60%	60%	17%	80%	100%	60%	50%
2018	60%	80%	17%	80%	100%	80%	50%
2019	80%	60%	17%	80%	100%	80%	50%
Growth between 2015 and 2019	33%	0%	0%	0%	0%	100%	0%
Average	64%	60%	17%	80%	100%	64%	50%

Luxury hotels were observed to have higher utilization rates for outsourcing housekeeping functions across all cities except for Taipei. Hotels in Hong Kong and Kuala Lumpur reported an average adoption rate of 80% and 100%, respectively, while those in Seoul and Singapore had significant upward growth. The increase in the utilization rate of outsourced housekeeping functions in Seoul can be attributed to the setting up of new hotels and an increase in the overall number of outsourced employees. For instance, InterContinental Grand Seoul Parnas was established in 2016 while Hilton increased the number of outsourced employees. The utilization rate for outsourced housekeeping employees varies in Bangkok due to the establishment of new hotels and changes to business strategies in response to political turbulence.

Upscale hotels

TABLE 49

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR HOUSEKEEPING FUNCTIONS (UPSCALE).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40%	20%	20%	60%	40%	60%	40%
2016	40%	20%	20%	60%	60%	60%	60%
2017	40%	20%	20%	60%	60%	60%	60%
2018	40%	20%	20%	60%	60%	60%	60%
2019	80%	20%	40%	60%	40%	60%	60%
Growth between 2015 and 2019	100%	0%	100%	0%	0%	0%	50%
Average	48%	20%	24%	60%	52%	60%	56%

In the upscale hotel segment, Hong Kong, Kuala Lumpur, Seoul, and Tokyo have a high utilization rate of more than 50% for outsourced housekeeping functions. Singapore witnessed a 40% increase between 2018 and 2019 whereas Hong Kong experienced a 20% dip during the same period due to political tension, which affected the hotel occupancy rates in the city.

Mid-tier hotels

TABLE 50

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR HOUSEKEEPING FUNCTIONS (MID-TIER).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	60%	60%	60%	71%	60%	80%	60%
2016	60%	60%	60%	100%	60%	80%	60%
2017	80%	60%	60%	100%	60%	80%	60%
2018	80%	60%	60%	100%	60%	80%	60%
2019	80%	60%	60%	100%	60%	80%	60%
Growth between 2015 and 2019	33%	0%	0%	40%	0%	0%	0%
Average	72%	60%	60%	94%	60%	80%	60%

The outsourcing utilization rate for housekeeping functions in mid-tier hotels is high, between 60% and 94% across all cities. Since mid-tier hotels prioritize cost efficiency and productivity, the use of outsourced housekeeping vendors allows the hotels to reduce costs and focus on other functions.

Budget hotels

TABLE 51

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR HOUSEKEEPING FUNCTIONS (BUDGET).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	20%	20%	0%	40%	60%	0%	100%
2016	20%	20%	0%	40%	60%	0%	100%
2017	20%	40%	0%	40%	60%	0%	100%
2018	40%	40%	0%	40%	60%	0%	100%
2019	40%	60%	20%	40%	80%	0%	100%
Growth between 2015 and 2019	100%	200%	0%	0%	33%	0%	0%
Average	28%	36%	4%	40%	64%	0%	100%

The utilization rate for outsourced housekeeping employees ranges between low and moderate levels in budget hotels across cities, except in Hong Kong and Tokyo. Employees working in budget hotels are encouraged to take up more than one task to expedite operational processes. Additionally, since housekeeping tasks in small-scale budget hotels can be easily completed, the use of outsourced employees may not benefit the segment. In Hong Kong and Tokyo, since key

functions are mostly taken up by locals many hotels face high manpower costs. Hence, the use of outsourced employees can help budget hotels reduce operational costs. As indicated in Table 51, budget hotels in Tokyo outsource 100% of their housekeeping functions due to their large scale of operation.

Comparison of Outsource Utilization Rate at Cities by Functions (Food and Beverage)

TABLE 52

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR FOOD AND BEVERAGE FUNCTIONS (OVERALL).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40%	35%	33%	64%	65%	40%	65%
2016	40%	30%	29%	64%	65%	45%	65%
2017	40%	40%	29%	64%	65%	45%	65%
2018	50%	40%	29%	64%	65%	50%	65%
2019	50%	45%	33%	64%	60%	50%	65%
Growth between 2015 and 2019	25%	29%	0%	0%	–8%	25%	0%
Average	44%	38%	30%	64%	64%	46%	65%

Traditionally, most hotels prefer growing and cultivating their F&B employees as these roles are driven by service quality. Hence, a standardized service crew is crucial as it impacts the hotel's overall brand image and reputation. In addition, hotels recruit renowned chefs to curate new dishes and menus as a way to attract more customers. Therefore, most hotels across the cities have fewer outsourced employees for F&B functions than for housekeeping. However, in recent years, with the improvement in service quality of external agencies, hotels have been shifting towards the adoption of outsourced F&B employees to mitigate the growing demand and cost of manpower.

Luxury hotels

TABLE 53

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR FOOD AND BEVERAGE FUNCTIONS (LUXURY).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40%	60%	50%	80%	80%	40%	50%
2016	40%	40%	33%	80%	80%	60%	50%
2017	40%	60%	33%	80%	80%	60%	50%
2018	60%	60%	33%	80%	80%	80%	50%
2019	60%	60%	33%	80%	80%	80%	50%
Growth between 2015 and 2019	50%	0%	–33%	0%	0%	100%	0%
Average	48%	56%	37%	80%	80%	64%	50%

Bangkok, Kuala Lumpur, and Hong Kong show high utilization rates for outsourced F&B functions in the luxury tier due to a higher volume of customers whereas hotels in Seoul have been increasing the use of outsourced employees over the years. For instance, InterContinental Grand Seoul Parnas

has boosted its outsourced F&B employee pool as more support is needed to serve the high volume of guests. The hotel has 1,100 rooms. Similarly, hotels in Singapore have been increasing the volume of outsourced employees in F&B functions since 2018.

Upscale hotels

TABLE 54

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR FOOD AND BEVERAGE FUNCTIONS (UPSCALE).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40%	20%	20%	60%	40%	60%	60%
2016	40%	20%	20%	60%	40%	60%	60%
2017	40%	20%	20%	60%	40%	60%	60%
2018	40%	20%	20%	60%	40%	60%	60%
2019	40%	20%	40%	60%	20%	60%	60%
Growth between 2015 and 2019	0%	0%	100%	0%	–50%	0%	0%
Average	40%	20%	24%	60%	36%	60%	60%

Upscale hotels have a higher utilization rate for outsourcing F&B functions in Seoul, Kuala Lumpur, and Tokyo. In contrast, Singapore, Bangkok, and Taipei have a low rate of utilization due to the high availability of manpower.

Mid-tier hotels

TABLE 55

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR FOOD AND BEVERAGE FUNCTIONS (MID-TIER).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	60%	60%	60%	57%	80%	40%	60%
2016	60%	60%	60%	57%	80%	40%	60%
2017	60%	60%	60%	57%	80%	40%	60%
2018	80%	60%	60%	57%	80%	40%	60%
2019	80%	60%	60%	57%	80%	40%	60%
Growth between 2015 and 2019	33%	0%	0%	0%	0%	0%	0%
Average	68%	60%	60%	57%	80%	40%	60%

Mid-tier hotels maintain a relatively higher utilization rate for outsourcing in F&B functions due to their business model; to sustain profitability, mid-tier hotels are often cost-driven due to their low ARR. Hotels in Hong Kong, Kuala Lumpur, and Tokyo maintain a high adoption rate of

outsourced F&B employees, while the adoption rate in Singapore picked up between 2017 and 2019, increasing from 60% to 80%, due to the tightening of its foreign dependency ratio.

Budget hotels

TABLE 56

UTILIZATION RATE OF OUTSOURCED EMPLOYEES FOR FOOD AND BEVERAGE FUNCTIONS (BUDGET).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	20%	0%	0%	60%	60%	20%	100%
2016	20%	0%	0%	60%	60%	20%	100%
2017	20%	20%	0%	60%	60%	20%	100%
2018	20%	20%	0%	60%	60%	20%	100%
2019	20%	40%	0%	60%	60%	20%	100%
Growth between 2015 and 2019	0%	40%	0%	0%	0%	0%	0%
Average	20%	16%	0%	60%	60%	20%	100%

Budget hotels across the cities continuously showed low utilization rates for F&B functions, except for the hotels in Tokyo which had a utilization rate of 100%. Based on the data points, it is observed that budget hotels in Tokyo operate at a larger scale with the number of rooms ranging between 100 to 380. As budget hotels are cost-sensitive, outsourcing employees can be a viable model to leverage variable costs.

Comparison of Employee Hours per Occupied Room at City Level

TABLE 57

EMPLOYEE HOURS PER OCCUPIED ROOM (OVERALL).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	4	8	12	7	5	5	5
2016	3	8	9	6	5	5	4
2017	2	7	7	6	5	4	4
2018	3	7	8	6	6	5	5
2019	3	8	8	6	5	4	4
Growth between 2015 and 2019	–14%	–2%	–33%	–19%	–4%	–22%	–6%
Average	3	8	9	6	5	5	4

The following formula is used to calculate employee hours per occupied room: (total number of hours worked per employee x FTEs) / total number of occupied rooms. The data on employee hours per occupied room is used to analyze the number of hours required by each employee for each occupied room.

Luxury hotels

TABLE 58

EMPLOYEE HOURS PER OCCUPIED ROOM (LUXURY).

Year	Singapore	Bangkok	Taipei*	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	2	11	24	10	9	11	5
2016	2	11	22	9	8	9	5
2017	2	12	22	11	9	10	6
2018	2	12	20	9	9	9	6
2019	2	12	21	8	11	7	7
Growth between 2015 and 2019	19%	9%	–11%	–15%	23%	–34%	39%
Average	2	12	22	9	9	9	6

*Grand Hyatt (outlier) was removed.

The analysis of luxury hotels reveals that Singapore and Tokyo have higher productivity levels as compared to other cities due to lower employee hours per occupied room. The number of employee hours per occupied room is seen to be significantly lower in the two cities due to higher compliance with job tasks and processes. Also, while Singapore continues to see high occupancy, Tokyo manages to employ fewer FTEs.

Overall, hotels in Taipei have the highest employee hours per occupied luxury room due to a lower occupancy rate compared to other cities. It has an average AOR of 71% whereas other cities, except Kuala Lumpur, have an AOR of more than 80%. A lower occupancy rate leads to increased idle time and based on the available data it can be inferred that Taipei hotels have poorer operational structures that lead to overall higher employee hours per occupied room. Luxury hotels in Kuala Lumpur, on the other hand, reduced the number of hours and employees required per shift allowing them to record more employee hours per occupied room, despite a lower AOR of 69%.

Upscale hotel

TABLE 59

EMPLOYEE HOURS PER OCCUPIED ROOM (UPSCALE).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	5	8	4	9	4	3	6
2016	5	8	4	9	4	3	7
2017	5	8	3	10	4	3	7
2018	4	8	5	11	5	4	7
2019	4	9	6	10	4	3	7
Growth between 2015 and 2019	–23%	3%	51%	10%	–16%	6%	15%
Average	4	8	4	10	4	3	7

In the upscale segment, hotels in Hong Kong, Seoul, Singapore, and Taipei performed better than the other cities with an average of four hours required per employee per occupied room. Hotels in Singapore continue to have a high occupancy rate in the upscale tier while Hong Kong, Seoul, and Taipei deployed less manpower and fewer man-hours.

Mid-tier hotels

TABLE 60

EMPLOYEE HOURS PER OCCUPIED ROOM (MID-TIER).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	5	5	7	3	7	6	3
2016	4	5	7	3	8	7	4
2017	4	5	8	3	7	7	4
2018	4	4	7	3	7	7	4
2019	5	4	7	3	8	9	4
Growth between 2015 and 2019	1%	–21%	–6%	–2%	14%	59%	26%
Average	4	5	7	3	7	7	4

Singapore continues to perform well in the mid-tier segment with lower levels of employee hours per occupied room. Similarly, Kuala Lumpur and Tokyo each require 3 to 4 hours per employee to complete operational tasks. These three cities see high occupancy rates and deploy minimal FTEs to support the overall operating process. Taipei and Hong Kong have lower labor productivity to due high manpower and man-hours.

Budget hotels

TABLE 61

EMPLOYEE HOURS PER OCCUPIED ROOM (BUDGET).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	4	9	2	5	2	4	3
2016	4	7	2	5	2	4	3
2017	4	7	2	5	2	5	3
2018	4	6	2	4	2	4	3
2019	3	6	2	4	2	4	3
Growth between 2015 and 2019	27%	34%	–6%	4%	2%	2%	–4%
Average	4	7	2	5	2	4	3

Across the board, budget hotels need fewer employee hours per occupied room since they deploy a smaller number of FTEs. Budget hotels in Hong Kong, Taipei, and Tokyo demonstrate high levels of labor productivity, with an average of 2 to 3 worker hours required per occupied room due to a low number of FTEs and high occupancy rates. In contrast, Bangkok and Kuala Lumpur have lower productivity levels due to the higher deployment of FTEs.

Comparison of Employee Hours per Occupied Room across Cities Functions (Front Office)

TABLE 62

FRONT OFFICE TASKS.

	Key FO Tasks	Breakup of FO Task (in %)
Task 1	Check-in and out	28%
Task 2	Guest relations and communications	22%
Task 3	Answer the phone and direct the call	11%
Task 4	Room checks and assignment	8%
Task 5	Payment process	7%
Task 6	Administrative	4%
Task 7	Greet clients	3%
Task 8	Interdepartmental work	1%
Task 9	Arrange transportation for guests	1%
Task 10	Others	16%

Figure 1 illustrates the overall front office process. As indicated in Table 62, Front Office Tasks, a large percentage of time is dedicated to customer relations, which includes greeting and welcoming guests, communicating during check-in and check-out, and profiling and verifying guest identity. Other back-end operations include interdependent communication with the housekeeping team to ensure rooms are ready, validation of room reservations, administrative work like entering customer data in the property management system, and handling payment processes.

FIGURE 1

FRONT OFFICE PROCESSES .

Comparison of Employee Hours per Occupied Room across Cities Functions (Front Office)

TABLE 63

EMPLOYEE HOURS PER OCCUPIED ROOM FOR FRONT OFFICE FUNCTIONS (OVERALL).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	0.5	0.8	1.5	1.0	0.6	0.5	0.6
2016	0.4	0.9	1.0	0.8	0.6	0.5	0.5
2017	0.4	0.8	1.0	0.9	0.6	0.6	0.6
2018	0.4	0.8	1.0	0.8	0.6	0.6	0.6
2019	0.4	1.0	1.0	0.8	0.5	0.6	0.7
Growth between 2015 and 2019	–3%	19%	–33%	–20%	–10%	13%	13%
Average	0.4	0.9	1.1	0.8	0.6	0.6	0.6

Overall, hotel front offices in Hong Kong, Seoul, Singapore, and Tokyo need lower employee hours per occupied room, with an average of 0.5 hours (30 minutes) due to higher utilization rates. Developing cities of Bangkok, Kuala Lumpur, and Taipei have lower productivity with higher employee hours per occupied room. Apart from the FO tasks outlined in Figure 1, employee hours per occupied room also include idle and waiting time across departments. The low occupancy rates also lead to more hours per FO employee, as seen in the case of hotels in Bangkok, Kuala Lumpur, and Taipei.

Luxury hotels

TABLE 64

EMPLOYEE HOURS PER OCCUPIED ROOM FOR FRONT OFFICE FUNCTIONS (LUXURY).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	0.3	1.3	3.6	1.5	1.0	0.7	0.6
2016	0.3	1.3	3.0	1.4	1.0	0.6	0.5
2017	0.3	1.3	2.9	1.6	1.0	0.7	0.8
2018	0.3	1.3	3.1	1.2	1.0	0.7	0.8
2019	0.3	2.1	3.2	1.0	1.1	0.6	0.9
Growth between 2015 and 2019	9%	58%	–10%	–31%	6%	–9%	56%
Average	0.3	1.5	3.2	1.3	1.0	0.7	0.7

Hotels in Singapore maintain a high average productivity level of 0.3 hours (18 minutes) for FO operations in the luxury tier. Similarly, Seoul and Tokyo have relatively high levels of productivity with an average of 0.7 hours required to complete FO tasks. The deployment of optimal FTEs and high occupancy rates are the key factors that affect productivity levels. Moreover, the adoption of back-end systems such as Customer Resource Management (CRM) tools and IoT enable higher productivity levels among employees. Across the cities, Bangkok, Kuala Lumpur, and Taipei have higher employment hours due to low occupancy rates and higher FTE deployment. Higher employment hours may also be attributed to increased idle time as a result of low FTE utilization rates.

Upscale hotels

TABLE 65

EMPLOYEE HOURS PER OCCUPIED ROOM FOR FRONT OFFICE FUNCTIONS (UPSCALE).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	0.4	0.9	0.8	1.1	0.3	0.4	0.8
2016	0.4	0.9	0.8	1.1	0.3	0.4	0.8
2017	0.5	0.8	0.7	1.2	0.3	0.4	0.8
2018	0.4	0.8	0.7	1.2	0.4	0.4	0.9
2019	0.5	1.0	0.8	1.2	0.2	0.4	0.9
Growth between 2015 and 2019	24%	7%	–4%	2%	–21%	7%	14%
Average	0.4	0.9	0.7	1.2	0.3	0.4	0.8

Upscale hotels in developed cities like Hong Kong, Seoul, and Singapore continue to exhibit high FO productivity due to high upscale hotel occupancy rates. Hotels in Tokyo, however, have low occupancy rates, which increases their average overall employment hours spent per occupied room for FO functions.

Mid-tier hotels

TABLE 66

EMPLOYEE HOURS PER OCCUPIED ROOM FOR FRONT OFFICE FUNCTIONS (MID-TIER).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	0.7	0.6	0.4	0.5	0.8	0.9	0.6
2016	0.7	0.7	0.4	0.5	0.8	1.0	0.6
2017	0.7	0.7	0.4	0.5	0.8	1.1	0.7
2018	0.6	0.6	0.4	0.5	0.8	1.2	0.6
2019	0.6	0.6	0.4	0.5	0.9	1.6	0.7
Growth between 2015 and 2019	–10%	–4%	2%	–4%	14%	71%	28%
Average	0.7	0.6	0.4	0.5	0.8	1.2	0.6

In the mid-tier segment, FO productivity levels in Singapore dropped slightly as compared to luxury (0.3 hours) and upscale (0.4 hours or 24 minutes) hotels. This may be the result of declining occupancy rates as compared to luxury and upscale hotels. Despite higher employee hours per occupied room, mid-tier hotels in Singapore report lesser employee hours due to fewer FTEs. Among other cities, hotels in Bangkok, Kuala Lumpur, and Taipei have high levels of productivity due to lower levels of employee hours and manpower deployment.

Budget hotels

TABLE 67

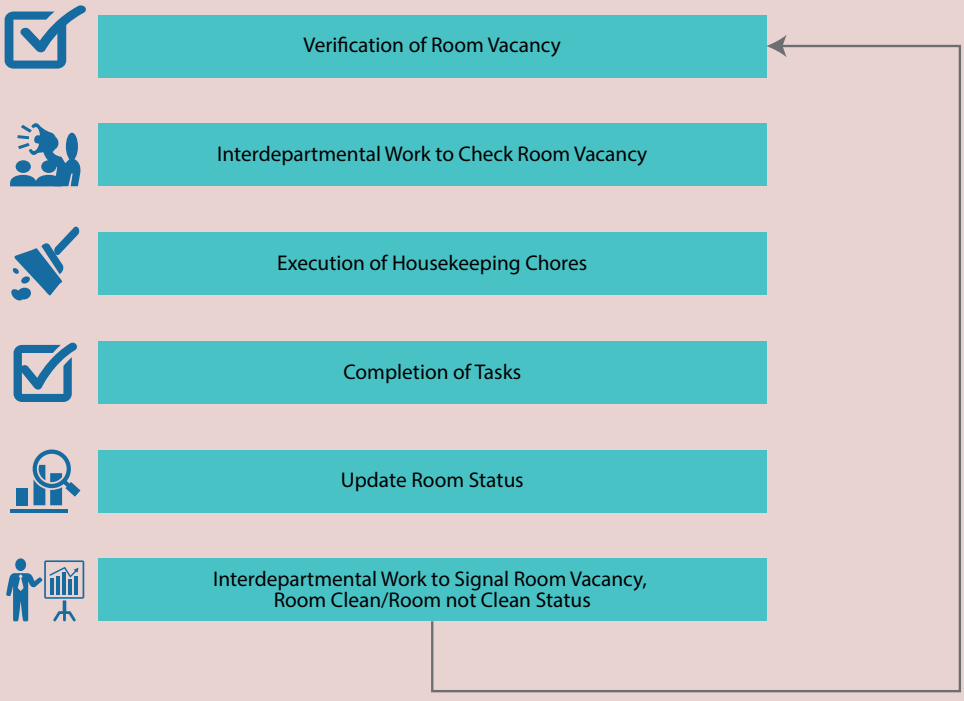
EMPLOYEE HOURS PER OCCUPIED ROOM FOR FRONT OFFICE FUNCTIONS (BUDGET).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	1.0	0.6	0.6	0.4	0.4	0.9	0.3
2016	1.0	0.5	0.5	0.4	0.4	0.9	0.3
2017	0.9	0.5	0.5	0.5	0.4	1.2	0.3
2018	1.0	0.5	0.6	0.4	0.4	0.9	0.3
2019	0.8	0.5	0.7	0.4	0.3	0.9	0.3
Growth between 2015 and 2019	–12%	–12%	30%	0%	–11%	–5%	6%
Average	0.9	0.5	0.6	0.4	0.4	1.0	0.3

Hotels across all cities, except in Singapore and Seoul, demonstrate high FO labor productivity levels in the budget segment. The low productivity level of hotels in Seoul and Singapore may be attributed to lower occupancy rates and utilization of FTEs. Bangkok, Hong Kong, Kuala Lumpur, Taipei, and Tokyo on the other hand witnessed high levels of occupancy, enabling hotels to fully maximize the capacity of their FO employees.

FIGURE 2

HOUSEKEEPING PROCESSES.



Comparison of Employee Hours per Occupied Room across Cities Functions (Housekeeping)

TABLE 68

EMPLOYEE HOURS PER OCCUPIED ROOM FOR HOUSEKEEPING FUNCTIONS (OVERALL).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	0.7	1.8	2.6	1.8	1.5	1.1	1.0
2016	0.6	1.8	2.2	1.4	1.4	1.1	1.0
2017	0.5	1.7	1.2	1.1	1.1	0.6	0.7
2018	0.6	1.7	2.1	1.4	1.8	1.2	1.0
2019	0.6	1.7	2.0	1.4	1.4	1.2	1.0
Growth between 2015 and 2019	4%	2%	26%	19%	4%	–5%	–5%
Average	0.6	1.7	2.0	1.4	1.4	1.0	0.9

Figure 2 illustrates the key processes undertaken by a housekeeping executive. The key tasks and duties include verifying a room's status, updating the server on housekeeping status, and executing all related tasks. While tasks under housekeeping functions are relatively straightforward to execute, ensuring hygiene and cleanliness as per the standard across all rooms is crucial, especially for rooms with high capacity.

Employee hours per occupied room include the execution of housekeeping tasks, related administrative tasks, and idle time. Also, more hours are required across all tiers to complete housekeeping work as compared to FO tasks. The study indicates that hotels in Seoul, Singapore, and Tokyo outperform their counterparts in other cities due to high customer volume and capacity. In contrast, hotels in Bangkok, Hong Kong, Kuala Lumpur, and Taipei require more employee hours per occupied room. In the case of Hong Kong, the high levels of employee hours utilized for housekeeping functions by the hotels may be due to the higher deployment of FTEs.

TABLE 69

COMPARISON OF TOTAL TIME TAKEN VS. ACTUAL TIME FOR HOUSEKEEPING (OVERALL).

Year	Classification	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	Time for HK	0.6	0.5	0.6	0.4	0.6	0.6	0.7
	Idle Time	0.1	1.3	2.0	1.3	0.9	0.5	0.3
2016	Time for HK	0.6	0.5	0.6	0.5	0.6	0.6	0.7
	Idle Time	0.1	1.3	1.6	1.0	0.9	0.5	0.2
2017	Time for HK	0.6	0.5	0.6	0.4	0.6	0.6	0.7
	Idle Time	0.0	1.2	0.6	0.6	0.5	0.1	0.0
2018	Time for HK	0.6	0.5	0.7	0.5	0.5	0.6	0.7
	Idle Time	0.0	1.2	1.4	1.0	1.2	0.7	0.3
2019	Time for HK	0.5	0.5	0.7	0.5	0.6	0.6	0.8
	Idle Time	0.1	1.2	1.3	0.9	0.8	0.5	0.2
	Growth between 2015 and 2019	4%	–5%	–12%	–11%	–3%	–7%	–15%
	Average	0.3	0.8	1.0	0.7	0.7	0.5	0.5

Table 69 depicts the average time taken for housekeeping tasks only and excludes idle time. In this section, the tabulation is derived from Section C, Average Time Taken to Clean a Room. The report points out that across the cities, hotels in Seoul, Singapore, and Tokyo lead the table with high productivity levels for housekeeping tasks.

In terms of idle time, Singapore has less variance between employees per occupied room and actual housekeeping time per room, indicating low levels of idle time and high productivity maximization amongst employees. Among other cities, hotels in Seoul and Tokyo show process improvement during the last five years.

Luxury hotels

TABLE 70

EMPLOYEE HOURS PER OCCUPIED ROOM FOR HOUSEKEEPING FUNCTIONS (LUXURY).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	0.5	2.4	6.7	2.1	2.0	1.8	1.3
2016	0.5	2.3	7.6	1.9	2.0	1.7	1.2
2017	0.4	2.1	3.4	1.7	1.6	0.5	1.2
2018	0.4	2.3	8.3	2.0	2.3	1.6	1.7
2019	0.4	2.7	8.0	1.5	2.6	1.4	2.1
Growth between 2015 and 2019	4%	–13%	–19%	28%	–30%	24%	–60%
Average	0.4	2.4	6.8	1.9	2.1	1.4	1.5

Similar trends are seen in the luxury hotel segment. Singapore demonstrates the highest productivity level based on the number of employee hours per occupied room, followed by Seoul and Tokyo. Singapore and Seoul have also witnessed process improvements with less time required to complete housekeeping tasks. The reason for this improvement in employee productivity could be the use of technology tools such as e-Housekeeping, Samfex, and HotSoS. In contrast, despite the high level of technology adoption, hotels in Tokyo register a decline in process improvements due to an increase in manpower and man-hours.

TABLE 71

COMPARISON OF TOTAL TIME TAKEN VS. ACTUAL FOR HOUSEKEEPING (LUXURY)

Year	Classification	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	Time for HK	0.6	0.6	0.5	0.4	0.4	0.8	1.0
	Idle Time	–0.1	1.8	6.2	1.7	1.6	1.0	0.3
2016	Time for HK	0.6	0.6	0.5	0.5	0.4	0.7	0.9
	Idle Time	–0.1	1.7	7.1	1.5	1.6	1.0	0.3
2017	Time for HK	0.6	0.6	0.5	0.4	0.3	0.7	0.9
	Idle Time	–0.2	1.5	2.9	1.3	1.3	–0.2	0.2

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Year	Classification	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2018	Time for HK	0.6	0.7	0.6	0.5	0.3	0.7	1.0
	Idle Time	–0.2	1.7	7.8	1.5	2.0	1.0	0.7
2019	Time for HK	0.6	0.6	0.6	0.6	0.4	0.8	1.1
	Idle Time	–0.1	2.1	7.4	1.0	2.3	0.6	1.0
	Growth between 2015 and 2019	–4%	–4%	–11%	–33%	7%	–3%	–12%
	Average	0.3	1.1	3.0	0.9	0.9	0.7	0.7

In the luxury hotel tier, Singapore continues to see high productivity in housekeeping tasks, followed by Seoul and Tokyo. The actual time taken, as mentioned in the table, indicates more time needed to complete housekeeping tasks in Singapore as compared to employee hours per occupied room. Hotels in Hong Kong, Kuala Lumpur, Seoul, and Tokyo exhibit a high level of productivity while those in Bangkok and Taipei experience lower productivity levels.

The study also points out that even though Bangkok, Singapore, and Taipei have lower technology adoption rates when compared to the other cities, hotels in Singapore have managed to keep employee hours per occupied room low and maintain high productivity. The country's high level of efficiency in housekeeping is a result of process improvement and staff training designed to reduce idle time.

Upscale hotels

TABLE 72

EMPLOYEE HOURS PER OCCUPIED ROOM FOR HOUSEKEEPING FUNCTIONS (UPSCALE).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	0.5	2.4	0.7	2.5	1.1	0.7	0.7
2016	0.5	2.3	0.8	2.4	1.0	0.8	0.8
2017	0.5	2.2	0.6	1.6	0.8	0.4	0.5
2018	0.6	2.4	0.6	2.5	1.3	0.9	0.8
2019	0.6	2.3	0.8	2.6	0.7	0.8	0.7
Growth between 2015 and 2019	–19%	3%	–8%	–4%	35%	–20%	4%
Average	0.5	2.3	0.7	2.3	1.0	0.7	0.7

Similar to its performance in the luxury segment, Singapore has a high level of productivity in the upscale hotels tier, as depicted in Table 72, Upscale hotels in Seoul and Tokyo also exhibit high levels of productivity with an average of 0.7 hours (42 minutes) required for housekeeping of each occupied room. Bangkok and Kuala Lumpur, however, have lower levels of productivity requiring an average of 2.3 hours (138 minutes) for housekeeping duties. In contrast, Taipei shows a higher level of productivity as upscale hotels in the city are comparatively smaller in size.

TABLE 73

COMPARISON OF TOTAL TIME TAKEN VS. ACTUAL HOUSEKEEPING TIME (UPSCALE).

Year	Classification	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	Time for HK	0.6	0.5	0.6	0.5	0.9	0.6	0.8
	Idle Time	0.4	0.6	0.1	0.6	1.7	1.2	0.7
2016	Time for HK	0.6	0.5	0.6	0.6	0.9	0.7	0.8
	Idle Time	0.4	0.6	0.1	0.5	1.6	1.4	0.8
2017	Time for HK	0.7	0.5	0.6	0.5	0.8	0.6	0.8
	Idle Time	0.4	0.5	0.0	0.2	0.9	1.1	0.6
2018	Time for HK	0.7	0.5	0.6	0.6	0.8	0.6	0.8
	Idle Time	0.5	0.5	0.1	0.5	2.2	1.7	0.8
2019	Time for HK	0.6	0.6	0.6	0.7	0.8	0.8	0.8
	Idle Time	0.6	0.6	0.1	0.6	2.0	2.1	0.8
	Growth between 2015 and 2019	–5%	–24%	–3%	–32%	9%	–32%	–4%
	Average	0.5	0.5	0.4	0.5	1.2	1.0	0.8

There is a large variance between actual time and employee hours per occupied room for Singapore in the upscale tier, indicating that more idle hours and administrative housekeeping tasks are incorporated into the role. As indicated earlier, upscale hotels have a high level of technology adoption, including the integration of technology tools in housekeeping functions. Technological add-ons such as IoT, smart rooms, and sensors ensure a seamless transition for interdepartmental work. Hence, housekeeping roles may entail more administrative tasks and less housekeeping work. Tools such as robot cleaning machines may also be utilized to reduce the time needed for the tasks and to standardize the overall hygiene quality.

Bangkok, Kuala Lumpur, and Taipei demonstrate better productivity levels in the upscale segment as compared to the luxury segment. Similarly, Bangkok and Kuala Lumpur have a higher rate of technology adoption while the hotels in Taipei are predominantly smaller in size.

Mid-tier hotels

TABLE 74

EMPLOYEE HOURS PER OCCUPIED ROOM FOR HOUSEKEEPING FUNCTIONS (MID-TIER).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	1.0	1.0	0.9	1.0	2.2	1.7	1.2
2016	1.0	1.1	0.9	0.9	2.2	1.8	1.3
2017	0.9	1.0	0.7	0.7	1.5	1.5	1.1
2018	1.0	1.0	0.9	0.9	2.7	2.1	1.3
2019	1.1	1.0	0.8	1.0	2.6	2.6	1.3
Growth between 2015 and 2019	–11%	2%	5%	–2%	–17%	–52%	–9%
Average	1.0	1.0	0.9	0.9	2.2	1.9	1.2

In the mid-tier segment, hotels in Bangkok, Kuala Lumpur, Singapore, and Taipei continue to perform well in terms of productivity in housekeeping functions. As evident from the earlier analysis on the correlation between technology and efficiency, higher technology adoption does not indicate more efficient employee hours. While in theory, technology can help expedite processes, traditional housekeeping practices are often more efficient than technology-assisted processes in carrying out tasks and duties due to the need for precision and to ensure high standards of hygiene. Hotels in Hong Kong, Seoul, and Tokyo, require more hours to carry out housekeeping tasks in mid-tier hotels despite high technology adoption. In comparison, hotels in Bangkok, Kuala Lumpur, Singapore, and Taipei complete their housekeeping tasks faster despite lower technology adoption rates.

TABLE 75

COMPARISON OF TOTAL TIME TAKEN VS. ACTUAL HOUSEKEEPING TIME (MID-TIER).

Year	Classification	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	Time for HK	0.5	0.5	0.8	0.4	0.6	0.4	0.5
	Idle Time	0.4	0.6	0.1	0.6	1.7	1.2	0.7
2016	Time for HK	0.5	0.5	0.8	0.4	0.6	0.5	0.5
	Idle Time	0.4	0.6	0.1	0.5	1.6	1.4	0.8
2017	Time for HK	0.5	0.4	0.8	0.4	0.6	0.4	0.5
	Idle Time	0.4	0.5	0.0	0.2	0.9	1.1	0.6
2018	Time for HK	0.5	0.5	0.8	0.4	0.5	0.4	0.5
	Idle Time	0.5	0.5	0.1	0.5	2.2	1.7	0.8
2019	Time for HK	0.5	0.4	0.8	0.4	0.6	0.5	0.5
	Idle Time	0.6	0.6	0.1	0.6	2.0	2.1	0.8
	Growth between 2015 and 2019	14%	11%	6%	5%	–14%	–4%	–7%
	Average	0.5	0.5	0.5	0.4	1.0	0.8	0.6

Bangkok, Kuala Lumpur, Singapore, and Taipei are the forerunners in terms of housekeeping productivity requiring an average of 0.4 hours (20 minutes) to 0.5 hours (30 minutes) for carrying out housekeeping functions across mid-tier hotels. Taipei has low variances between employee hours per occupied room and actual hours spent. In addition to the effectiveness of technology adoption in housekeeping roles, the low volume of FTEs in Seoul and Tokyo may have undermined the overall productivity level in mid-tier hotels. Moreover, process improvement in housekeeping can also be achieved due to factors other than technology adoption. Delving into the gap between actual hours and employee hours per occupied room, housekeeping employees in Hong Kong, Seoul, and Tokyo have the highest idle time. This may, however, indicate that more time is spent on administrative tasks than on housekeeping work. Some examples include learning how to operate machines and using new gadgets to improve housekeeping processes.

Budget hotels

TABLE 76

EMPLOYEE HOURS PER OCCUPIED ROOM FOR HOUSEKEEPING FUNCTIONS (BUDGET).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	1.3	1.5	0.8	0.9	0.5	1.5	0.7
2016	1.3	1.2	0.7	0.9	0.6	1.7	0.8
2017	1.0	1.1	0.7	0.6	0.3	2.0	0.4
2018	1.3	0.9	0.7	0.9	0.7	1.7	0.8
2019	1.0	0.9	0.7	0.9	0.5	1.7	0.7
Growth between 2015 and 2019	–26%	–40%	–8%	–1%	–2%	14%	4%
Average	1.2	1.1	0.7	0.8	0.5	1.7	0.7

While hotels in Singapore have high productivity levels across luxury, upscale, and mid-tier segments, its budget hotels fall behind in housekeeping productivity due to low levels of technology adoption. While it has been observed that technology tools have a low to moderate impact on productivity in labor-intensive tasks such as housekeeping, the use of delivery robots can reduce the time needed to clean a room. A housekeeping attendant will still need to be present to ensure quality control. However, such technology tools are yet to be adopted by budget hotels and many of them still rely on traditional housekeeping tools like vacuum cleaners. Hence, budget hotels suffer in terms of productivity due to a lack of supporting tools to expedite the cleaning process.

In addition, the number of FTEs in the housekeeping function is significantly higher than in other functions, indicating fewer hours and duties required per employee. Hotels in Hong Kong, Kuala Lumpur, and Taipei perform better in this segment due to the higher utilization rate of outsourcing and smaller room sizes, while those in Bangkok, Seoul, and Singapore have lower productivity. Tokyo and Hong Kong have high utilization of outsourcing employees, indicating higher reliance on external resources to ease workload so that employees can handle more important tasks. On the other hand, Seoul has fewer FTEs at an average of 8 housekeeping staff, indicating lower productivity per employee.

TABLE 77

COMPARISON OF TOTAL TIME TAKEN VS. ACTUAL HOUSEKEEPING TIME (BUDGET).

Year	Classification	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	Time for HK	0.6	0.4	0.5	0.4	0.5	0.6	0.6
	Idle Time	0.7	1.1	0.3	0.5	0.0	0.9	0.1
2016	Time for HK	0.6	0.4	0.5	0.4	0.5	0.6	0.6
	Idle Time	0.7	0.8	0.3	0.5	0.1	1.1	0.2
2017	Time for HK	0.6	0.4	0.5	0.4	0.5	0.5	0.7
	Idle Time	0.5	0.7	0.3	0.3	–0.2	1.5	–0.2

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Year	Classification	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2018	Time for HK	0.5	0.4	0.7	0.4	0.4	0.5	0.6
	Idle Time	0.8	0.5	0.0	0.5	0.2	1.2	0.2
2019	Time for HK	0.5	0.4	0.7	0.4	0.6	0.5	0.8
	Idle Time	0.4	0.5	0.0	0.5	0.0	1.2	–0.1
	Growth between 2015 and 2019	15%	–1%	–53%	5%	–3%	11%	–44%
	Average	0.6	0.6	0.4	0.4	0.3	0.8	0.4

Compared to the other hotel tiers, most budget hotels across the cities have a lower rate of technology adoption. In addition, budget hotels are usually compact in size and offer only essential amenities to customers. Hence, compared to the other tiers, budget hotels have less average idle time as availability and vacancy of rooms is crucial to ensure less waiting time. The housekeeping staff at budget hotels may be expected to follow only the minimum standard of hygiene required by the hotel association, which would lead to a higher speed of execution.

Comparison of Employee Hours per Occupied Room across Cities Functions (Food and Beverage)

TABLE 78

FOOD AND BEVERAGE TASKS.

	Key F&B Tasks	Breakup of F&B Tasks (%)
Task 1	Take orders, plan, forecast, and execute food and beverage orders	26%
Task 2	Back-of-House (BOH) operations-related work like serving, food preparation, cleaning, etc.	21%
Task 3	Greeting and recommend menu	13%
Task 4	Payment process	6%
Task 5	Food safety	3%
Task 6	Inventory management	3%
Task 7	Table arrangement	3%
Task 8	Menu design	2%
Task 9	Reservation and online booking	2%
Task 10	Seat arrangement	2%
Task 11	Banquet event	1%
Task 12	Room service	1%
Task 13	Interdepartmental work	1%
Task 14	Restaurant operations	1%
Task 15	Others	15%

Figure 3 illustrates the key processes undertaken by F&B operations. A hotel's F&B department operates two important divisions, the front-of-house, and the back-of-house. Both work hand-in-hand to ensure coordination across all departments for seamless operation and delivery of services to ensure customer satisfaction. The core duties of a front-of-house service crew include customer relations, maintaining service quality, introducing menus and specials/promotions, and executing F&B orders. Back-of-house teams focus on inventory management, food, hygiene, and safety, and coordinate with various departments, such as room and online reservations, sales and marketing, and other areas to adequately attract, forecast, and capture new customers.

FIGURE 3

F&B ROLES AND PROCESSES.

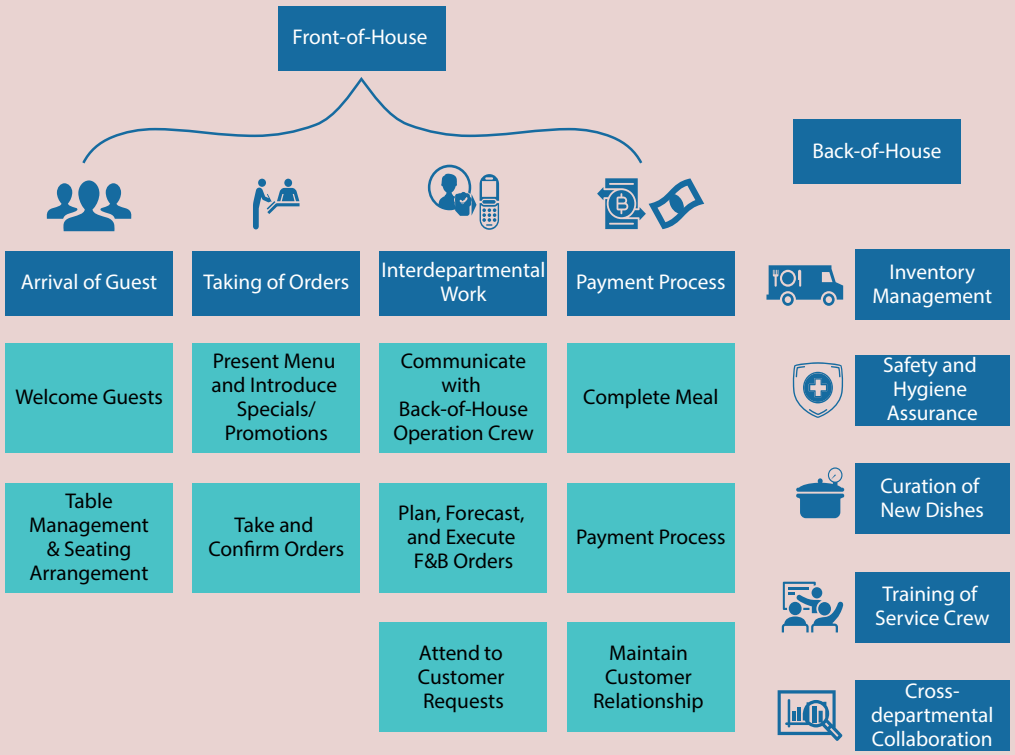

TABLE 79

EMPLOYEE HOURS PER OCCUPIED ROOM FOR FOOD AND BEVERAGE FUNCTIONS (OVERALL).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	0.6	0.9	1.3	0.6	0.8	0.4	0.1
2016	0.5	0.9	0.9	0.7	0.8	0.3	0.2
2017	0.4	0.9	0.8	0.7	0.8	0.2	0.2
2018	0.4	0.9	0.7	0.6	1.0	0.3	0.2
2019	0.4	0.7	1.0	0.5	0.9	0.3	0.2
Growth between 2015 and 2019	27%	25%	25%	17%	–10%	34%	–11%
Average	0.5	0.9	1.0	0.6	0.8	0.3	0.2

The research on employee hours per occupied room indicates that F&B functions have high productivity as they are based on the speed of execution and delivery to reduce customer waiting time. Hotels in Seoul, Singapore, and Tokyo have the highest levels of productivity with only 0.2 to 0.5 employee hours (12 to 30 minutes) required per occupied room. Of the three cities, hotels in Singapore and Seoul[2] have the highest productivity due to the high utilization rate[3] as compared to Tokyo. Moreover, Singapore has lower technology adoption rates than Seoul and Tokyo, indicating that strong productivity is not contingent upon the level of technology adoption. Bangkok, Hong Kong, and Taipei report the lowest productivity levels due to their higher volume of customers.

Luxury hotels

TABLE 80

EMPLOYEE HOURS PER OCCUPIED ROOM FOR FOOD AND BEVERAGE FUNCTIONS (LUXURY).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	0.4	1.7	1.9	0.3	1.5	0.5	0.3
2016	0.4	1.7	1.8	0.8	1.5	0.3	0.3
2017	0.3	1.9	1.6	0.8	1.6	0.2	0.4
2018	0.2	1.9	1.6	0.5	1.8	0.3	0.4
2019	0.3	1.4	2.1	0.5	1.9	0.2	0.3
Growth between 2015 and 2019	25%	20%	–6%	–55%	–31%	55%	–22%
Average	0.3	1.7	1.8	0.6	1.7	0.3	0.3

In the luxury segment, hotels in Seoul, Singapore, and Tokyo have the highest employee productivity levels with an average of 0.3 hours (18 minutes) per occupied room. As visible in Table 80, luxury hotels in Bangkok, Seoul, Singapore, and Tokyo experienced productivity improvement in their F&B functions. In particular, the progress reported by hotels in Seoul and Tokyo may be due to the adoption of technology tools and process improvement. In comparison, Singapore has higher labor productivity despite a lower rate of technology adoption. Luxury hotels that have streamlined F&B roles, tasks, and processes as a way to reduce manpower and help employees transition better across different assignments may have seen productivity gains.

Upscale hotels

TABLE 81

EMPLOYEE HOURS PER OCCUPIED ROOM FOR FOOD AND BEVERAGE FUNCTIONS (UPSCALE).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	0.4	0.6	0.5	0.2	0.4	0.0	0.2
2016	0.4	0.6	0.5	0.2	0.3	0.0	0.2

(Continued on next page)

[2] Number of covers to employees: Singapore, 2827; Seoul, 2193; and Tokyo, 812.
[3] The high volume of customers in a hotel indicates the high resource utilization rate of employees and facilities, etc.

(Continued from the previous page)

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2017	0.3	0.5	0.3	0.2	0.3	0.0	0.2
2018	0.2	0.5	0.3	0.2	0.5	0.1	0.2
2019	0.2	0.3	1.1	0.2	0.3	0.0	0.2
Growth between 2015 and 2019	48%	44%	–95%	–10%	2%	12%	–20%
Average	0.3	0.5	0.5	0.2	0.4	0.1	0.2

In the upscale tier, hotels in Kuala Lumpur, Seoul, Singapore, and Tokyo continue to witness high levels of productivity with employee hours per occupied room ranging between 0.1% to 0.3%. Upscale hotels in Seoul and Singapore remain the forerunners in terms of productivity in the F&B segment due to their high utilization rate while the number of F&B covers remains low for hotels in Kuala Lumpur and Tokyo.

Mid-tier hotels

TABLE 82

EMPLOYEE HOURS PER OCCUPIED ROOM FOR FOOD AND BEVERAGE FUNCTIONS (MID-TIER).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	0.8	0.6	0.6	0.6	0.9	0.4	0.2
2016	0.7	0.6	0.5	0.7	0.9	0.5	0.2
2017	0.6	0.6	0.5	0.7	0.9	0.4	0.2
2018	0.6	0.6	0.4	0.5	1.1	0.4	0.2
2019	0.6	0.6	0.5	0.6	1.2	0.5	0.2
Growth between 2015 and 2019	28%	2%	13%	11%	–36%	–20%	–30%
Average	0.7	0.6	0.5	0.6	1.0	0.4	0.2

Compared to luxury and upscale hotels, mid-tier hotels in Singapore have low productivity. The study indicates that mid-tier hotels in Singapore have a higher rate of technology adoption than luxury and upscale hotels. Besides, mid-tier hotels also have the highest utilization rate of outsourced employees at 60% as compared to the 48% and 40% utilization rates of luxury and upscale hotels, respectively. A high utilization rate of outsourced employees may lead to a knowledge gap as the workers may not have received internal or specialized training from their respective agencies on the use of technology tools. Similar to luxury and upscale hotels, mid-tier hotels invest heavily in their employees. Hence, the use of outsourced employees may have reduced the overall productivity levels due to the lack of training or process reviews.

Budget hotels

TABLE 83

EMPLOYEE HOURS PER OCCUPIED ROOM FOR FOOD AND BEVERAGE FUNCTIONS (OVERALL).

Year	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	0.2	0.8	0.03	0.1	0.3	0.1	0.0
2016	0.2	0.6	0.03	0.1	0.3	0.1	0.1
2017	0.2	0.6	0.03	0.1	0.3	0.1	0.1
2018	0.2	0.5	0.04	0.1	0.3	0.1	0.1
2019	0.1	0.4	0.05	0.2	0.2	0.1	0.0
Growth between 2015 and 2019	31%	53%	–89%	–9%	9%	–2%	–5%
Average	0.2	0.6	0.0	0.1	0.3	0.1	0.1

Budget hotels across the city have the highest productivity levels as many F&B restaurants are often compact and have a fast turnover. In addition, many budget hotels do not offer F&B services. The study indicates that budget hotels in all seven cities have high productivity levels, requiring only 0.1 to 0.3 employee hours per occupied room to complete F&B tasks, with Bangkok being an exception at 0.6 hours.

TECHNOLOGY ADOPTION ANALYSIS

Technology Adoption across Cities by Tier

TABLE 84

NUMBER OF TECHNOLOGIES ADOPTED BY HOTELS PER TIER.

	All Cities	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Average		4	4	3	3	3	3	3
Luxury	3	3	2	3	4	4	4	4
Upscale	4	4	3	5	3	3	3	3
Mid-tier	3	6	5	2	2	4	3	3
Budget	3	1	6	1	2	3	2	4

Table 84 illustrates the number of technologies adopted by hotels in the seven cities across the four tiers. As indicated, hotels in Singapore and Bangkok have adopted an average of four technology solutions, while hotels in the other five cities have adopted an average of three technologies.

Overall, upscale hotels have adopted a higher number of technologies across all tiers. However, as indicated in the qualitative analysis, mid-tier hotels in Singapore have the highest number of technology solutions followed by the hotels in the upscale segment. Upscale and mid-tier hotels are more inclined than the other tiers toward improving productivity and processes due to the availability of grants and subsidies.

In contrast, luxury and budget hotels are low on technology adoption. This may be because luxury hotels lay more emphasis on service quality and budget hotels focus on operational efficiency. Hong Kong, Kuala Lumpur, Seoul, and Tokyo have the highest adoption of technologies within the luxury segment since they have standardized operational requirements. On the other hand, budget hotels have varied technology adoption depending on their operational strategies. In particular, budget hotels in Bangkok have the highest technology adoption numbers as the participating hotels in this segment are franchisees of international hotels with large customer volumes (Ibis hotel and Novotel hotel are both outliers).

TABLE 85

COST OF INVESTMENT IN TECHNOLOGY BY TIER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	894,817	775,055	177,394	1,030,340	594,688	1,483,961	1,546,731
Luxury	543,750	1,158,333	231,389	3,133,333*	816,333	934,955	3,185,956
Upscale	1,150,000	1,440,726	159,583	1,377,487	284,500	4,818,878	1,516,667
Mid-tier	1,687,101	542,058	233,750	231,333	617,940	438,000	410,000
Budget	25,750	168,894	81,763	62,500	686,600	5,500	734,431

* Outlier: The numbers from Kuala Lumpur include the higher cost of investment by Mandarin Oriental and JW Marriott.

Table 85 depicts the overall cost of investment in technology across the hotel tiers by city. As indicated, upscale and mid-tier hotels in most cities have comparatively high costs of investment in technology. In particular, Kuala Lumpur, Seoul, Singapore, and Tokyo have the highest cost of investment, at about USD1 million. In general, hotel managers feel that productivity dive is low in Kuala Lumpur and hence luxury hotels keep investing in new technologies such as predictive maintenance, remote check-in and check-out, IoT, robotics, and e-Housekeeping.

As indicated by the respondents, the most common technologies adopted by hotels across cities include Opera Hotel Edition, Wi-Fi upgrades, and mobile applications. Many hotels are also moving towards adopting new technologies such as IoT, cloud solutions, robotics, e-Housekeeping, Big Data and business intelligence, smart keys, and smart rooms solutions.

Productivity Perspective by Cities

In this section, Frost & Sullivan assesses the sentiment of hotel managers towards productivity. The assessment is based on the following factors: the importance of productivity, the impact of productivity and technology adoption on customer satisfaction, manpower deployment, and man-hours. Hotel managers were required to rate the factors on a five-point scale, with one (1) indicating not important at all and five (5) as very important. The data tabulated in this section are derived from Section F, questions 1 to question 6. Table 86, Average of Q1 to Q6, shows the averages of data taken from Table 87, Section F Q1 (Productivity Importance) to Table 92, Section F Q6 (Likelihood of Adopting Technological Enhancement Tools).

TABLE 86

AVERAGE OF Q1 TO Q6.

	Productivity Metrics							
	All Cities	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Average		3.99	4.29	3.99	4.23	4.29	4.22	4.10
Luxury	4.24	4.45	3.88	4.04	4.19	4.52	4.63	3.83
Upscale	4.11	3.75	4.45	4.00	4.50	4.19	3.80	4.25
Mid-tier	4.30	4.50	4.90	4.25	4.04	4.05	3.90	4.60
Budget	3.97	3.06	3.85	3.65	4.50	4.42	4.50	3.75

In essence, hotel managers understand and agree that productivity can add value to operational efficiency (see Table 86, Average of Q1 to Q6), with respondents from all cities rating it at 3.9 and above. Broadly, the key sentiments that drive productivity improvement involve two factors: productivity importance and the impact of customer satisfaction. In terms of impact on technology adoption on manpower deployment and man-hours, luxury, upscale, and mid-tier hotels rate it at four (4) points and above.

Among the cities that were part of this research, respondents from Singapore have given a lower rating despite the high profitability indicators as seen in the regional analysis. Frost & Sullivan identifies that the productivity and profitability indicators display huge variances in Singapore due to the hotels' lack of focus on technology adoption. Singapore exhibits a high margin for profitability indicators due to high ARR and AOR. In addition, apart from their focus on profitability, hotels in Singapore are driven by high productivity. The hotels achieve this through cost reduction and profit maximization by leveraging foreign manpower for crucial tasks. Last, Singapore businesses are

grant-driven, which may impede productivity growth as they are not inclined to adopt new technologies without incentives or rewards.

Respondents from Bangkok, Hong Kong, Kuala Lumpur, Seoul, and Tokyo have given high ratings across the various productivity metrics, despite exhibiting low-to-moderate profitability indicators. Compared to Singapore, these cities are geographically large, which allows room for new hotels and other recreational services. As such and due to strong competition, hotels in these cities may have to reduce their hotel room pricing to attract more customers. Moreover, Bangkok, Hong Kong, and Taipei continue to experience market volatility due to frequent political unrest, which reduces the volume of inbound tourists. The following factors summarize the differences between productivity and profitability indicators.

TABLE 87

SECTION F: Q1 (PRODUCTIVITY IMPORTANCE).

	Section F: How Important is Productivity to your Hotel?							
	All Cities	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Average		4.32	4.74	4.71	4.83	4.78	4.56	4.71
Luxury	4.70	4.60	3.80	4.67	3.80	3.80	4.00	3.38
Upscale	4.70	4.20	4.80	4.80	4.00	3.60	4.80	4.80
Mid-tier	4.73	4.80	5.00	5.00	4.86	4.80	4.00	4.60
Budget	4.52	2.80	4.40	4.40	2.80	5.00	3.60	5.00

Table 87, Section F: Q1 (Productivity Importance), explains the importance of productivity across different hotel tiers in each city. Across all cities, hotel managers in Bangkok, Hong Kong, and Kuala Lumpur have rated productivity higher in importance as compared to other cities. Productivity importance ranges between 3.6 to 4.8 points in luxury, upscale, and mid-tier hotels while budget hotels see a lower rating for the factor. The mid-tier hotels regard productivity as highly important since most of them focus on time efficiency cost-saving operational procedures to maintain a healthy level of profitability without undermining the service quality.

TABLE 88

SECTION F: Q2 (PRODUCTIVITY IMPACT).

	Section F: How Impactful is Productivity to Overall Customer Satisfaction?							
	All Cities	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Average		4.16	4.58	4.62	4.56	4.56	4.17	4.38
Luxury	4.42	4.40	4.00	4.50	4.50	5.00	4.75	4.00
Upscale	4.48	4.20	4.80	4.60	4.50	4.50	4.00	4.80
Mid-tier	4.54	4.40	5.00	5.00	4.71	4.20	3.60	4.80
Budget	4.26	3.50	4.40	4.40	4.33	4.60	4.50	4.00

Table 88, Section F: Q2 (Productivity Impact), evaluates the impact of productivity on customer satisfaction. With an average rating of four (4) points and above, hotels across all cities believe that productivity has a high impact on customer satisfaction. Hotels in Bangkok, Hong Kong, Kuala Lumpur, and Taipei regard productivity as highly important to customer satisfaction, with an average rating of more than 4.5, especially within the mid-tier segment where a majority of the

hotels gave a rating between 4.7 and five (5). Overall, respondents from the upscale and mid-tier hotels have given the highest ratings for productivity indicating that employees spend less idle time while serving customers more efficiently.

TABLE 89

SECTION F: Q3 (IMPACT OF TECHNOLOGY ADOPTION ON PRODUCTIVITY).

	Section F: How Impactful is Technology Adoption for Overall Productivity?							
	All Cities	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Average		4.11	4.05	3.81	4.11	4.17	4.11	3.90
Luxury	4.06	4.40	3.50	3.83	4.25	4.50	4.50	3.67
Upscale	4.06	4.00	4.40	3.80	4.25	4.00	3.60	4.40
Mid-tier	4.24	4.60	4.80	4.20	3.71	4.20	4.00	4.40
Budget	3.71	3.25	3.40	3.40	4.67	4.00	4.50	3.20

Table 89, Section F: Q3, reflects the impact of technology adoption on overall productivity. Here, the rating levels range slightly lower between 3.8 and 4.1. In general, hospitality and service quality form the blueprint for success in hospitality management services. Hotels perceive technology as important back-end support to enhance efficiency and promote process improvement. However, productivity is linked to customer satisfaction as hotels indicate that productivity measures and initiatives should translate into higher customer satisfaction and better service touchpoints.

Since managers of luxury and upscale hotels across cities emphasize customer satisfaction, they feel that the adoption of self-service kiosks and powered delivery robots may have a negative impact on customer satisfaction because they eliminate some customer touchpoints. In addition, employees are also concerned about the ability to perform tasks and duties after integrating new technologies. This may also hinder the adoption of technology for productivity gains.

Hotels in cities like Taipei and Tokyo highly value face-to-face interaction with customers. This is reflected in the low rating given by the respondents from the two cities on the impact of technology adoption on productivity. In contrast, respondents in the fast-paced cities of Hong Kong, Seoul, and Singapore gave higher ratings ranging between 4.11 and 4.17. Despite the overall low rating and less enthusiasm towards the adoption of technology, the mid-tier hotels rate the impact of technology adoption on productivity much higher than the other tiers.

TABLE 90

SECTION F: Q4 (IMPACT OF TECHNOLOGY ADOPTION ON MANPOWER).

	Section F: How Helpful is Technology Adoption for Manpower Deployment?							
	All Cities	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Average		3.84	4.37	3.90	4.06	4.11	4.06	4.19
Luxury	4.24	4.60	4.25	4.00	3.75	4.25	4.75	4.17
Upscale	3.88	3.20	4.40	4.00	4.25	4.00	3.60	3.80
Mid-tier	4.19	4.40	5.00	4.00	3.86	3.80	3.60	4.80
Budget	3.97	3.00	3.80	3.60	4.67	4.40	4.50	4.00

Table 90, Section F: Q4, rates the impact of technology adoption on manpower deployment. The table indicates that across the board, respondents have given a low rating, between 3.0 to 4.3 points, for this factor. Hotel managers in Bangkok, Hong Kong, and Tokyo have given comparatively higher ratings to the factor unlike respondents from other cities, including Singapore and Taipei who have given the lowest 3.8 and 3.9 ratings.

Productivity is rated as relatively higher in Singapore in terms of profitability due to higher ARR and occupancy rates. Many Singapore hotels enjoy higher occupancy rates than other cities. However, in terms of process improvement, Singapore may be lacking in technological innovation despite government initiatives to push for process improvement. This gap may stem from the heavy dependence on low-cost foreign labor and reliance on government grants. The majority of foreign labor is employed for the front office, housekeeping, and F&B roles due to the lack of diversity among the local talent. As Singapore hotels leverage their provision of low-wage jobs, they do not see the benefit of integrating new technologies for process improvement.

Many hotels in Singapore are grant-driven as part of the government's effort to build a safety net for businesses. However, the underlying issue may be the lack of initiative among hotels to improve processes as they remain largely manpower-driven. On an international scale, hotels in Singapore have a low rate of technology adoption due to their over-reliance on manpower.

TABLE 91

SECTION F: Q5 (IMPACT OF TECHNOLOGY ADOPTION ON MAN-HOURS).

	Section F: How Helpful is Technology Adoption for Reduction of Man-hours?							
	All Cities	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Average		3.84	4.16	3.62	4.19	4.31	4.55	3.90
Luxury	4.07	4.40	3.75	3.83	4.25	4.33	4.50	3.50
Upscale	4.00	3.60	4.20	3.60	5.00	4.25	4.00	4.00
Mid-tier	4.27	4.60	4.80	3.80	3.86	4.00	4.40	4.40
Budget	3.75	2.50	3.80	3.20	4.33	4.67	4.50	3.80

Table 91, Section F: Q5, shows the hotel management's perception of the impact of technology adoption on man-hours. The responses show high variance for this factor across the cities, with Seoul giving the highest average rating of 4.55 while Taipei rates it 3.62 points.

The consensus is that hotels benefit from adopting technology to reduce man-hours, with respondents from luxury and mid-tier hotels rating it higher at 4.07 and 4.27, respectively. However, budget hotels exhibit less inclination and desire towards technology adoption to reduce man-hours and improve productivity.

Among the developed cities, Singapore and Tokyo score lower on this factor. Hotels in Singapore continue to have poor sentiment towards the adoption of technology for process improvement due to high reluctance to invest and reliance on foreign employees. Hotels in Tokyo are less receptive to the adoption of technology due to low acceptance at the cultural level. In addition, Tokyo's low productivity drive is due to process inefficacies and legal implications of retrenchment of employees on businesses, resulting in lower productivity.

TABLE 92

SECTION F: Q6 (LIKELIHOOD OF ADOPTING TECHNOLOGICAL ENHANCEMENT TOOLS).

	Section F: How Likely will you Adopt Technological Tools to Enhance Productivity in your hotel?							
	All Cities	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Average		3.63	3.63	3.19	3.83	3.89	4.00	4.00
Luxury	3.97	4.40	3.50	3.33	4.00	4.25	4.50	4.00
Upscale	3.52	2.60	3.40	3.40	4.00	3.75	4.00	3.60
Mid-tier	3.81	4.40	4.00	3.20	3.43	3.80	3.60	4.40
Budget	3.61	3.00	3.60	2.80	4.33	3.80	4.00	4.00

Table 92, Section F: Q6, captures the hotels' sentiments about the likelihood to integrate technological enhancement tools. As indicated in the table, Hong Kong, Kuala Lumpur, Seoul, and Tokyo share high ratings of 3.9 and above while Bangkok, Singapore, and Taipei indicate lower preferences with ratings of 3.6 and below.

On an overall level, luxury and mid-tier hotels show a keen interest in adopting new technologies. Singapore continues to exhibit a low inclination toward technology adoption. Apart from its reliance on foreign labor and government grants to ease operational processes, the city's productivity level is largely driven by manpower instead of automation. As seen in the regional analysis, Singapore emerged as the top city on a majority of the profitability indicators due to its high ARR and occupancy rate. However, a huge variance in terms of technology adoption rates and profitability indicators is seen in Singapore.

Technology Adoption Rate across Cities by Functions (Key Analysis)

Adoption of technologies across different functions depends on the availability of human resources (HR) and skillsets that could match the needs of the hotels in respective cities. While the availability of manpower may vary in different countries, many hotels have adopted IoT, AI, ML, and Data Analytics for resource optimization in their operational processes to spur efficiency and productivity.

Developed cities like Hong Kong, Seoul, Singapore, and Tokyo are known to have a high level of technology adoption as compared to developing cities like Bangkok, Kuala Lumpur, and Taipei due to high manpower costs and their well-established technology ecosystems. An analysis of cities in developed countries indicates that Singapore has implemented data-centric technology tools to support back-end developments and functions.

The city-state has the highest technology penetration rate for key functions such as sales and marketing, human resource, and engineering in comparison with Hong Kong, Seoul, and Tokyo. This may be due to the easy availability of foreign manpower in Singapore that enables the hotels in the city to prioritize technology adoption for back-end (non-customer facing) functions. In addition, these functions require lower manpower resources as compared with front-end operations where employees can multitask and integrate job functions to reduce the manpower count. Besides, with many hoteliers expressing concern about the depreciation of customer service due to technology adoption, solutions are often offered to increase overall efficiency in areas that support

revenue generation and back-end operation efficiency. This is evident through the high profitability margin as seen in the chapter, Profitability Analysis.

Other developed cities like Hong Kong, Seoul, and Tokyo have implemented more technology solutions for front-end operations, largely involving front office, housekeeping, and F&B functions. As employees are unable to attend to more than one customer at a time, technology tools are integrated into front-end operations that require more manpower. In addition, hotels in these cities are more likely to experiment with novel ideas like the use of Public Cleaning Robots and F&B Delivery Robots due to high manpower costs.

The rate of technology penetration is much lower in developing markets due to the easy availability of manpower and the low availability of technology-literate workers. Among the three developing cities, hotels in Bangkok and Kuala Lumpur have a higher rate of technology adoption. Also, hotels in developing cities seem to adopt a similar approach as Singapore where the majority of their technology tools are implemented across back-end functions due to the availability of manpower for the front-end duties. Taking into account the effect of technology diffusion at the regional level, hotels in developing cities seem to implement technology solutions depending on the effectiveness and success of developed cities. Technology solutions such as IoT, AI, ML, e-Housekeeping, e-Compendium, building management, reputation management, and social listening tools are seen to have a higher penetration rate than other solutions.

Technology Adoption Rate across Cities by Functions (Front Office)

In this section, Frost & Sullivan evaluates the adoption rates of various technologies across the cities and hotel tiers. Section F: Q9 and Q10 seek to understand the types of technologies adopted in the front office, housekeeping, F&B, engineering, security, sales and marketing, finance, human resources, and other departments. The following table explains the overview of technology adoption in hotels across seven cities.

Among the technologies, IoT has the highest rate of adoption across all cities, with hotels adopting it as part of their operating model. It is followed by video analytics and AI. Technology adoption across cities is largely driven by back-end automation and the use of tools such as IoT, AI, and ML to allow seamless check-in. Similarly, developed cities such as Hong Kong, Seoul, and Singapore use technology tools such as Smart Check-in at the Front Office to expedite the check-in process.

Video Analytics has a higher penetration among all Front Office operations primarily to ensure tighter security and to study consumer behavior. across all seven cities, robotics and RPA have the lowest penetration rate among all technology solutions listed by the respondents due to the service-oriented nature of the industry. Compared across developed and developing cities, hotels in Taipei are low in technology adoption in front office operations.

In Singapore, Oracle's cloud-based management system is commonly used to eliminate manual intervention and automate tasks across different departments. It also makes the accessibility of data across different management levels and teams easier. Hotels in Hong Kong and Seoul use the mobile check-in system to reduce manpower deployment. Hotels in Bangkok are known to be manpower-driven due to their high standards of hospitality and culture while Kuala Lumpur and Taipei have some degree of automation using cloud computing to streamline data and allow higher visibility of operations and work across various departments.

TABLE 93

OVERVIEW OF TECHNOLOGY ADOPTION (FRONT OFFICE)*.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
IoT	60%	55%	29%	64%	70%	45%	65%
Robotics	0%	15%	0%	0%	0%	5%	9%
RPA	20%	10%	5%	9%	5%	5%	9%
Video Analytics	30%	5%	24%	23%	25%	10%	22%
AI & ML	30%	30%	10%	18%	15%	35%	17%

* The table explores and analyzes technology adoption across all four tiers.

Technology Adoption Rate across Cities by Tier (Front Office)

Internet of Things

TABLE 94

ADOPTION RATE OF IoT FOR FRONT OFFICE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	55%	60%	29%	64%	70%	45%	65%
Luxury	20%	40%	17%	60%	80%	40%	38%
Upscale	40%	80%	20%	60%	40%	80%	60%
Mid-tier	100%	60%	20%	71%	80%	60%	80%
Budget	60%	60%	60%	60%	80%	0%	100%

In terms of technology adoption for front-office functions, IoT tools are rated high amongst hotels in Bangkok, Hong Kong, Kuala Lumpur, Singapore, and Tokyo. By tier, the upscale and mid-tier hotels have the highest rate of IoT adoption. In particular, process improvements are evident through the adoption of new technologies such as upgraded Wi-Fi, cloud solutions, paperless check-in, online travel agency integration, contactless payment, and predictive maintenance. Opera and Oracle are two of the most common hotel management systems adopted across the cities. However, a home-grown brand such as Pegasus of Malaysia is in demand among domestic hotels. Brands such as Samsotech of UAE have been adopted to support mobile check-in systems to facilitate a faster check-in process for business travelers.

Robotics

TABLE 95

ADOPTION RATE OF ROBOTICS FOR FRONT OFFICE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	15%	0%	0%	0%	0%	5%	9%
Luxury	0%	0%	0%	0%	0%	20%	13%
Upscale	40%	0%	0%	0%	0%	0%	20%
Mid-tier	20%	0%	0%	0%	0%	0%	0%
Budget	0%	0%	0%	0%	0%	0%	0%

While the adoption of IoT applications for FO functions is high, the adoption of robotics is very low as is evident from Table 95, Adoption of Robotics in Front Office; the majority of hotels across cities have indicated zero adoption. Hotels in Seoul, Singapore, and Tokyo show minor demand for robotics largely among the upscale and mid-tier hotels and luxury hotels in the case of Seoul.

As explained earlier, as the first service touchpoint for all arriving guests, FO is one of the most crucial departments for any hotel. Hence, the lack of human interaction and overuse of technology tools may have a detrimental effect on guest satisfaction. Therefore, careful decision-making and calibration are required to understand the benefits of using technology in FO roles. Nonetheless, the upscale and mid-tier hotels see the highest adoption rates in Singapore due to higher customer volumes within this segment. Seoul and Tokyo witness higher adoption rates in the luxury and upscale tiers due to higher customer volumes and bigger hotel sizes.

Robotic Process Automation (RPA)

TABLE 96

ADOPTION RATE OF RPA FOR FRONT OFFICE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	10%	20%	5%	9%	5%	5%	9%
Luxury	0%	20%	0%	20%	0%	20%	13%
Upscale	20%	20%	20%	0%	0%	0%	20%
Mid-tier	20%	40%	0%	0%	0%	0%	0%
Budget	0%	0%	0%	20%	20%	0%	0%

As compared to robotics, RPA has a slightly better rate of adoption for FO functions across all cities, between 5% and 20%. Overall, the adoption of RPA remains low in the sector since hotels barely want to replace human interaction with technology. Broadly, luxury, upscale, and mid-tier hotels adopt some form of RPA technology with the implementation of chatbots, AI, Oracle, NetSuite, and other modes of enterprise resource planning systems.

Video Analytics

TABLE 97

ADOPTION RATE OF VIDEO ANALYTICS FOR FRONT OFFICE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	5%	30%	24%	23%	25%	10%	22%
Luxury	0%	40%	33%	40%	0%	0%	13%
Upscale	20%	0%	20%	40%	0%	40%	20%
Mid-tier	0%	40%	40%	0%	40%	0%	20%
Budget	0%	0%	0%	20%	60%	0%	40%

Video analytics can detect the number of people in the hotel lobby, identify guests through facial recognition upon arrival, and support seamless check-in and access to rooms. The adoption rates of video analytics for FO functions remain low to moderate, ranging between 5% and 30%. Bangkok sees the highest adoption rates across all hotel tiers with 30% penetration, broadly by the luxury and mid-tier hotels. Low productivity sentiment amongst Singapore hotels is reflected in the low adoption rate of video analytics. Some of the key video analytics technologies adopted include virtual concierge services, virtual reality hotel tours, 360 video analytics, and crowd management.

Artificial Intelligence and Machine Learning

TABLE 98

ADOPTION RATE OF AI & ML FOR FRONT OFFICE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	30%	30%	10%	18%	15%	35%	17%
Luxury	20%	40%	33%	20%	0%	40%	25%
Upscale	40%	0%	0%	40%	20%	80%	20%
Mid-tier	40%	40%	0%	14%	0%	20%	0%
Budget	20%	40%	0%	20%	40%	0%	20%

AI and machine learning have moderate-to-high levels of adoption in FO functions across the seven cities, ranging from 15% in Hong Kong to 30% in Bangkok. The adoption rates are high across all hotel tiers, except Taipei where only luxury hotels are adopting AI and ML solutions. It may be noted that Taiwan began stepping up its effort to support the incubation and development of start-ups, talent, and technological competencies only in 2021 with the announcement of the Taiwan AI Action Plan.

The adoption rates for AI and ML tools are prevalent across luxury, upscale, and mid-tier hotels while budget hotels saw a much lower adoption rate except in Hong Kong. Unlike other cities where budget hotels are largely standalone, those in Hong Kong are mostly franchisees of domestic budget brands, such as Rosedale, Empire, and Kimberly, with multiple branches. Due to economies of scale, these budget hotels are inclined to improve their productivity and processes. Technologies such as I-arrive and virtual concierge services are also among the technologies adopted by the FO.

Technology Adoption Rate across Cities (Housekeeping)

Technology adoption in the housekeeping department is highest in developed cities with IoT, e-Housekeeping, and data analytics for resource optimization being the most adopted solutions across the seven cities. Also, unlike the FO, housekeeping leverages technology tools such as robotics and RPA due to the labor-intensive nature of its functions. The use of such tools is believed to be less effective than manpower deployment since the housekeeping attendant's judgment and decision-making skills play a huge role in this area; robotics functions are seen to have limited roles as they are unable to reach certain corners and are not capable of decision-making. Thus, the housekeeping staff is still deployed as gatekeepers to ensure standards of hygiene are in line with the hotel's protocol.

Hotels in Hong Kong, Seoul, and Tokyo have indicated higher adoption of Privacy and Makeup Rooms and Integrated Smart Rooms due to the higher manpower cost. On the other hand, hotels in

Singapore have a lower adoption rate of 30% for Privacy and Make-up Rooms and 40% for Integrated Smart Rooms due to the availability of foreign manpower during the pre-pandemic era of 2015 to 2019. Due to the lack of talent in Hong Kong, Seoul, and Tokyo, the implementation of solutions like Privacy and Makeup Room are often manpower-centric as it reduces the need to make multiple trips to an occupied room and reduces manpower deployment.

Despite having access to foreign workers, the hotel industry in Singapore is transitioning towards adopting such technology solutions to reduce reliance on manpower-driven processes. Respondents from Millennium & Copthorne Hotel mentioned that they have commissioned a consultancy study to understand how to integrate Radio-frequency identification (RFID) and AI into its functions to reduce the manpower count. The use of the Privacy and Make-up Room and Integrated Smart Room is largely manpower-centric as it reduces the number of trips needed to make to check on room occupancy.

Among the developing cities, hotels in Bangkok, Kuala Lumpur, and Taipei have implemented a slew of technologies. However, unlike in developed cities, where more technologies are being implemented, operational models in developing cities are manpower-driven. For instance, compliance within the housekeeping services in Bangkok is still manpower and process-driven. Similarly, tracking the timely completion of housekeeping tasks by manpower continues to be the key benchmark of efficiency.

Technology Adoption Rate across Cities by Tier (Housekeeping)

TABLE 99

OVERALL TECHNOLOGY ADOPTION (HOUSEKEEPING).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
IoT	45%	30%	19%	50%	50%	40%	57%
Robotics	20%	30%	0%	14%	5%	5%	17%
RPA	10%	10%	5%	9%	10%	10%	4%
Video Analytics	25%	0%	5%	18%	20%	35%	17%
AI and ML	15%	10%	10%	14%	25%	30%	17%
e-Housekeeping	55%	35%	33%	36%	45%	25%	39%
RFID Uniform & Linen	25%	25%	10%	14%	30%	30%	26%
Privacy and Make-up Room	30%	20%	29%	27%	55%	50%	48%
Housekeeping and Power-Assisted	30%	5%	5%	23%	35%	40%	39%
Housekeeping Delivery Robot	10%	10%	0%	5%	5%	5%	13%
Public Area Floor Cleaning Robots	15%	10%	5%	9%	15%	5%	22%
Data Analytics for Resource Optimization	60%	5%	33%	23%	45%	40%	48%
Integrated Smart Room	40%	25%	33%	45%	70%	45%	61%
e-Compendium	45%	35%	24%	27%	45%	35%	39%

Internet of Things

TABLE 100

ADOPTION RATE OF IoT FOR HOUSEKEEPING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	30%	45%	19%	50%	50%	40%	57%
Luxury	0%	40%	17%	40%	40%	40%	38%
Upscale	20%	60%	20%	60%	40%	60%	40%
Mid-tier	60%	60%	20%	43%	60%	60%	80%
Budget	40%	20%	20%	60%	60%	0%	80%

The housekeeping department is slightly behind the FO department in terms of IoT adoption in hotels across cities. This ranges from 19% in Taipei to 57% in Tokyo. The adoption of IoT for housekeeping is prevalent across upscale and mid-tier hotels. In Singapore, IoT has been adopted for housekeeping across all tiers of hotels except the luxury segment. This reflects the emphasis of luxury hotels to provide more touchpoints to customers.

Deep-diving into the types of IoT tools adopted, e-Housekeeping solutions are commonly used to ensure seamless interdepartmental work. Brands such as Samfex and HotSoS are adopted to unify communication across departments, reduce idle time, and optimize the overall speed of cleaning between guest arrivals.

Robotics

TABLE 101

ADOPTION RATE OF ROBOTICS FOR HOUSEKEEPING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	25%	20%	0%	14%	5%	5%	17%
Luxury	0%	40%	0%	40%	20%	20%	25%
Upscale	40%	0%	0%	20%	0%	0%	40%
Mid-tier	60%	20%	0%	0%	0%	0%	0%
Budget	0%	20%	0%	0%	0%	0%	0%

In terms of the adoption rates for robotics in housekeeping, it is slightly higher than in FO. Most hotels are still uncertain about the accuracy of robotic cleaning machines and hence the adoption remains low. However, hotels across six cities, excluding Taipei, are slowly adopting these tools to improve their cleaning and operational processes. Concerns about the accuracy of robotic solutions and their ability to make pre-emptive judgments are a few key investment considerations that make it difficult to justify the contribution of robotics in housekeeping. Moreover, the housekeeping department may need to include an additional supervisory step to ensure that the cleaning done by a robot is at par with that of human labor. Hotels across tiers in Taipei are yet to include robotics in their housekeeping process since the technology is at a relatively nascent stage. Some notable cleaning robots are N-bot by Novotel and Techi Robot by Park Avenue Rochester Hotel.

Robotic Process Automation

TABLE 102

ADOPTION RATE OF RPA FOR HOUSEKEEPING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	10%	10%	5%	9%	10%	10%	4%
Luxury	0%	20%	17%	40%	20%	40%	13%
Upscale	20%	0%	0%	0%	0%	0%	0%
Mid-tier	20%	20%	0%	0%	0%	0%	0%
Budget	0%	0%	0%	0%	20%	0%	0%

RPA solutions for housekeeping functions have been adopted across all cities, with an average rate of 8%. While hotels in Bangkok, Hong Kong, Seoul, and Singapore have a 10% adoption rate for RPA, those in Kuala Lumpur, Taipei, and Tokyo have lower adoption rates of 4% to 9%. The use of chatbots in the housekeeping department has increased efficiency and reduced error rates by deploying them to gain an understanding of customer needs. For instance, integrated surveys have been implemented at Kempinski Hotel in Singapore to assess customer expectations before their stay and to establish customer profiles. Similarly, in-stay surveys are used to assess the level of satisfaction experienced and after-stay surveys are conducted to seek feedback about the guests' overall satisfaction. The collection of large amounts of data will require the integration of multiple technology platforms, such as cloud computing, AI, and ML to reduce additional back-end work and errors as well as to ensure that time can be adjusted to address decision-making issues.

The low adoption rate for RPA in housekeeping is largely tied to hotels' resistance to operational changes and the huge investment costs involved. Downsizing departments and adjusting job scopes are other pain points that key decision-makers face when considering the adoption of RPA technology tools.

e-Housekeeping

TABLE 103

ADOPTION RATE OF E-HOUSEKEEPING FOR HOUSEKEEPING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	35%	55%	33%	36%	45%	25%	39%
Luxury	60%	60%	33%	60%	40%	40%	38%
Upscale	40%	60%	20%	0%	40%	0%	40%
Mid-tier	40%	40%	40%	43%	40%	40%	80%
Budget	0%	60%	40%	40%	60%	20%	0%

The adoption of e-Housekeeping technologies is moderate across all cities, with an average of 38%. Hotels in Bangkok and Hong Kong have the highest level of adoption at 55% and 45%, respectively. Across all tiers, luxury, upscale, and mid-tier hotels have the highest implementation rates.

As explained earlier, technology tools such as Samfex and HotSoS are commonly adopted to streamline processes, promote interdepartmental communication, and better manage room cleaning. For instance, after the completion of servicing each room, a housekeeping attendant can enter the room's status via the hotel's communication platform to provide real-time updates.

Apart from these tools, smart room solutions such as I-rooms and e-Housekeeping are slowly being incorporated as part of the housekeeping process to reduce operational hurdles and improve the transition between different departments. In addition, RFID door sensors are being integrated with building management systems to alert the housekeeping department when rooms are available for cleaning.

RFID Uniform and Linen Management

TABLE 104

ADOPTION RATE OF RFID UNIFORM AND LINEN MANAGEMENT FOR HOUSEKEEPING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	25%	25%	10%	14%	30%	30%	26%
Luxury	40%	40%	17%	20%	20%	40%	0%
Upscale	20%	0%	0%	20%	0%	40%	20%
Mid-tier	40%	20%	0%	14%	40%	40%	0%
Budget	0%	40%	20%	0%	60%	0%	100%

Housekeeping departments in hotels across all cities have lower adoption of RFID uniform and linen management tools for tracking garments, linen, and uniforms. The adoption of this technology can enable housekeeping attendants to count linen by using a hand-held scanner. This reduces the potential for miscalculation and time taken during manual counting. The adoption of RFID uniform and linen management is seen mostly across luxury, upscale, and mid-tier hotels. Budget hotels are slowly adopting this technology.

Privacy and Make-up Room Signaling

TABLE 105

ADOPTION RATE OF PRIVACY AND MAKE-UP ROOM SIGNALING FOR HOUSEKEEPING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	20%	30%	29%	27%	55%	50%	48%
Luxury	20%	20%	17%	40%	60%	60%	25%
Upscale	40%	20%	60%	40%	20%	100%	40%
Mid-tier	20%	40%	20%	14%	80%	40%	80%
Budget	0%	40%	20%	20%	60%	0%	60%

The adoption of privacy and make-up room signaling tools is prevalent across Hong Kong, Seoul, and Tokyo in the range of 40% to 50%. In contrast, Bangkok, Singapore, and Taipei are slowly picking up this technology.

The low-to-moderate adoption of this technology in Singapore is seen across all tiers, except for budget hotels that have zero adoption. The use of privacy and make-up room signaling tool requires interdepartmental cooperation across housekeeping, building management, and security to incorporate sensors and network systems. These changes require security system updates and the adoption of new interfaces to synchronize the various adjustments. Hence, many hotels in Singapore have high levels of resistance to the adoption of privacy and make-up room signaling solutions. However, given the COVID-19 pandemic, many hotels have undertaken initiatives to re-evaluate their operational processes and productivity gaps.

Hotels in Hong Kong, Seoul, and Tokyo have a high inclination to adopt these solutions due to higher labor wages since the majority of their employees are locals and the cities have a low reliance on foreign workers. These sensors transmit information through back-end engineering once the person leaves the room, signaling the housekeeping department to take the required actions. Hence, hotels see the use of privacy and make-up room signaling technology as an avenue to reduce manpower and man-hours. An example of one such technology already adopted is RFID door sensors.

Housekeeping Power-assisted Delivery

TABLE 106

ADOPTION RATE OF POWER-ASSISTED DELIVERY FOR HOUSEKEEPING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	5%	30%	5%	23%	35%	40%	39%
Luxury	0%	20%	17%	40%	40%	40%	25%
Upscale	20%	20%	0%	20%	0%	80%	20%
Mid-tier	0%	40%	0%	14%	60%	40%	20%
Budget	0%	40%	0%	20%	40%	0%	100%

In terms of housekeeping power-assisted delivery, hotels in Hong Kong, Seoul, and Tokyo top the table with high adoption rates of 35% and more while the other four cities have lower adoption rates between 5% and 30%. Hong Kong, Seoul, and Tokyo are early adopters of new technologies due to the push for digital transformation at the national level. Hence, integrating technology and automation is now central to their growth and accelerated productivity strategy. Another area that supports higher adoption rates in these cities is the lower cost of foreign labor. The transition towards technology supports a sustainable approach to and long-term solution for mitigating the high costs of manpower.

Singapore and Taipei, however, continue to exhibit low adoption for housekeeping power-assisted delivery. As explained earlier, the factors leading to low productivity stem from an over-reliance on foreign workers, lack of momentum to embark on productivity initiatives, and hotels' focus on profitability indicators.

Upscale hotels in Bangkok, Kuala Lumpur, Singapore, and Tokyo have a 20% adoption rate for the use of housekeeping power-assisted delivery. Since most of these hotels like MBS, Oakwood, Oasia, Hilton, and Carlton are newly built it is easier to incorporate and facilitate the use of new technologies. In the past, hotels have creatively adopted robots for their housekeeping trolleys, but have been constrained by the limitation of their facilities. For example, their lift's mechanism is unable to synchronize with the automated housekeeping trolley's Internet-based mechanism. Further, luxury hotels are often situated in historic buildings that are unable to support the modifications necessary to adopt such new technologies.

Taipei has the lowest adoption rate as the development and use of new technology tools remain nascent. With Taiwan's transformative plan to embark on AI and other new technologies, hotels are expected to become more receptive to them once the nation achieves productivity and technology diffusion.

Housekeeping Delivery Robots

TABLE 107

ADOPTION RATE OF DELIVERY ROBOTS FOR HOUSEKEEPING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	10%	10%	0%	5%	5%	5%	13%
Luxury	0%	20%	0%	20%	20%	20%	13%
Upscale	20%	0%	0%	0%	0%	0%	20%
Mid-tier	20%	20%	0%	0%	0%	0%	20%
Budget	0%	0%	0%	0%	0%	0%	0%

Housekeeping delivery robots have a low adoption rate of 5% to 13% across all cities. However, its adoption is most prevalent in luxury and mid-tier hotels. The use of this technology is particularly high in Tokyo since Japan has superior IoT infrastructure, cloud computing, and AI expertise. In recent years, demand for edge computing (the combination and use of AI and IoT) has been increasing due to the successful implementation of smart homes and smart hotels [10]. As such, businesses and consumers are highly receptive to the integration of new technology tools that enhance productivity.

The South Korea Novotel recently adopted N-bot, a delivery robot developed by KT Corporation, to deliver basic amenities such as towels, water, and soap to guests. Similarly, The Relay robot, manufactured by US firm Savioke, was introduced at the Shinagawa Prince Hotel N Tower in Seoul.

Nevertheless, some factors may restrict the adoption of delivery robots. Hotel managers point out that the accuracy of executing a task remains a work in progress. Many of these robots require consistent system upgrades and accurate mapping of hotel routes to ensure that they do not cause any hazards to customers and employees. Older hotels may resist the adoption of delivery robots the most as system integration and the creation of new delivery routes are required to ensure that the robots can accurately deliver items to guests.

Hotels in Bangkok, Hong Kong, Kuala Lumpur, Singapore, and Taipei report lower adoption of delivery robots for housekeeping functions due to the easy availability of low-wage workers. In addition, hotel respondents from these cities are concerned that overuse of technology may reduce task precision and human interaction.

Public Area Floor Cleaning Robot

TABLE 108

ADOPTION RATE OF PUBLIC AREA FLOOR CLEANING ROBOTS FOR HOUSEKEEPING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	10%	15%	5%	9%	15%	5%	22%
Luxury	0%	20%	17%	40%	20%	0%	38%
Upscale	40%	0%	0%	0%	20%	20%	20%
Mid-tier	0%	20%	0%	0%	20%	0%	0%
Budget	0%	20%	0%	0%	0%	0%	20%

Public area floor cleaning robots have low adoption rates of 5% to 22% in hotels across all seven cities. In terms of tiers, robots have the highest adoption in luxury and upscale hotels. Hong Kong and Tokyo have the highest adoption rates of 15% and 22%, respectively, due to the integration and usage of 5G networks and IoT infrastructure. As illustrated in Table 107, Adoption of Delivery Robots for Housekeeping Functions, hotels in Tokyo have a higher adoption rate for new robotics due to the available IT infrastructure and because businesses and consumers are highly receptive to these technologies. Similarly, Hong Kong has embarked on the use of public area floor-cleaning robots to reduce manpower deployments.

Data Analytics for Resource Optimization

TABLE 109

ADOPTION RATE OF DATA ANALYTICS FOR RESOURCE OPTIMIZATION (HOUSEKEEPING FUNCTIONS).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	5%	60%	33%	23%	45%	40%	48%
Luxury	20%	40%	33%	40%	20%	60%	63%
Upscale	0%	60%	60%	40%	40%	80%	60%
Mid-tier	0%	80%	20%	14%	80%	20%	20%
Budget	0%	60%	20%	0%	40%	0%	40%

Hotels across the seven cities in this report display moderate to high adoption of data analytics for resource optimization in housekeeping, in the range of 5% to 60%. Overall, hotels in Bangkok, Hong Kong, Seoul, and Tokyo have adoption rates of 40% and above. In terms of adoption by tier, luxury, upscale, and mid-tier hotels have the highest adoption rates for data analytics and resource optimization tools. The respondents also unanimously agree that the integration of back-end operations supports productivity growth and optimization. The study indicates that promoting

digitalization, ePayment, and deployment of various cloud solutions, IoT, and Big Data has driven process improvements in housekeeping operations.

Interestingly, unlike the other six cities, hotels in Singapore lag in the use of data analytics tools for resource optimization with an overall adoption rate of 5% for housekeeping functions. As indicated in Table 109, luxury hotels in Singapore have a 20% adoption of data analytics tools. Resistance to the adoption of new technologies results from the issues of system integration and synergy across departments, cost-benefit inertia, and management hesitancy to undertake new systems.

Integrated Smart Room

TABLE 110

ADOPTION RATE OF INTEGRATED SMART ROOM FOR HOUSEKEEPING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	25%	40%	33%	45%	70%	45%	61%
Luxury	60%	40%	50%	80%	60%	20%	38%
Upscale	20%	40%	20%	40%	60%	100%	40%
Mid-tier	20%	60%	40%	29%	100%	60%	80%
Budget	0%	20%	20%	40%	60%	0%	100%

Table 110 highlights that the adoption of integrated smart rooms is high across all cities and tiers, ranging between 20% and 100%. With the integration of touchless control, automation, and connectivity with mobile applications that enable seamless navigation, smart room integration is becoming more prevalent in the hotel industry. For example, Smart-in room lighting has increased customer satisfaction and reduced electricity costs. Other smart room practices include the adoption of the AI-based room control system GiGA Genie. Of the cities, Singapore has the lowest average adoption rate of 25%. Hotels across all tiers, except budget hotels, have integrated smart rooms to streamline processes and ensure a smoother customer interface during their stay. Budget hotels in Seoul and Singapore, on the other hand, have zero adoption of integrated smart rooms.

e-Compendium

TABLE 111

ADOPTION RATE OF e-COMPENDIUM FOR HOUSEKEEPING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	35%	45%	24%	27%	45%	35%	39%
Luxury	60%	60%	17%	20%	40%	40%	25%
Upscale	40%	40%	40%	0%	40%	40%	0%
Mid-tier	40%	60%	20%	43%	80%	40%	57%
Budget	0%	20%	20%	40%	20%	20%	60%

e-Compendium has been adopted across the board by hotels in all seven cities and tiers. Its integration has enabled hotels to go paperless and revamp the hospitality experience. Hotels across all cities, except Kuala Lumpur and Taipei, show a high adoption rate of 35% and more. In Singapore, Fullerton Hotel has adopted e-Compendium solutions in partnership with Tapendium and Samsung to transform the hospitality experience and educate customers on new service touchpoints [11]. As part of the solution, iPads and tablets have been embedded in the front office and housekeeping departments enabling customers to request items readily. However, budget hotels in Singapore still have zero adoption as hotel owners have low motivation to adopt new technologies due to the lack of economies of scale. In addition, there is high resistance from senior management to rebrand or change their business model and strategies as many of these hotels are family-owned with limited hospitality expertise.

Technology Adoption Rate across Cities (Food and Beverage)

IoT, online reservation and ordering, and mobile ordering for the crew are the most popular technologies with the highest adoption rate across all seven cities. With the rise of the internet and technology, smart applications such as Chope, Hungry Wongnai (Thailand), Eatigo, and others have partnered with hotels to increase F&B occupancy as another source of revenue. Compared to developed cities with higher adoption rates, developing cities are low in technology adoption due to lower levels of internet penetration across various cities. Also, while mobile ordering for the crew is widely adopted across most cities, hotels in Bangkok and Taipei have a much lower adoption.

Apart from the technology solutions as mentioned, breakfast tracking and data analytics for resource optimization has also been widely adopted by hotels in Singapore. This indicates Singapore's preference for leveraging back-end technologies to support front-end operations. On the contrary, hotels in Hong Kong, Seoul, and Tokyo reported higher adoption of manpower-centric applications such as Power Assisted Delivery (the solution aims to aid staff in moving heavy loads safely).

TABLE 112

OVERALL TECHNOLOGY ADOPTION (FOOD AND BEVERAGE).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
IoT	55%	30%	19%	41%	50%	40%	48%
Robotics	20%	5%	0%	9%	10%	0%	0%
RPA	15%	5%	5%	9%	5%	0%	0%
Video Analytics	20%	0%	19%	14%	20%	20%	22%
AI & ML	20%	5%	10%	9%	25%	25%	30%
Breakfast Tracking	40%	15%	29%	23%	25%	15%	17%

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	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Online Reservation and Ordering	65%	45%	33%	50%	70%	70%	78%
Mobile-ordering for Crew	45%	15%	19%	41%	70%	55%	61%
Table Queue Management	40%	20%	38%	18%	45%	45%	48%
Power Assisted Delivery	15%	10%	10%	18%	45%	35%	39%
Data Analytics for Resource Optimization	30%	10%	33%	14%	45%	45%	39%
Food Management	35%	10%	10%	32%	40%	55%	65%
Crowd Management	20%	10%	5%	23%	50%	40%	43%
F&B Delivery Robots	0%	0%	5%	0%	5%	5%	0%

Internet of Things (IoT)

TABLE 113

ADOPTION RATE OF IOT FOR FOOD AND BEVERAGE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	30%	55%	19%	41%	50%	40%	48%
Luxury	20%	20%	33%	20%	40%	40%	38%
Upscale	40%	100%	40%	80%	40%	80%	40%
Mid-tier	40%	60%	0%	43%	80%	40%	60%
Budget	20%	40%	0%	20%	40%	0%	60%

IoT, which has already made its way into other functions of the hotel industry, is getting integrated into the F&B segment as well. Overall, IoT adoption in F&B ranges from moderate to high. Except for Taipei, hotels across the six cities report IoT adoption of 30% and above. Similarly, F&B departments in upscale and mid-tier hotels have IoT adoption of 40% and above. The technology is mostly used for inventory management to enable active and automatic tracking of food inventory and safety monitoring. Broadly, IoT applications in hotels fall within food management and waste management. Point-of-sale systems such as Oracle MICROS Simphony are also embedded in restaurant systems to enable seamless and contactless payment.

Robotics

TABLE 114

ADOPTION RATE OF ROBOTICS FOR FOOD AND BEVERAGE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	5%	20%	0%	9%	10%	0%	0%
Luxury	0%	40%	0%	20%	40%	0%	0%
Upscale	20%	0%	0%	0%	0%	0%	0%
Mid-tier	0%	20%	0%	0%	0%	0%	0%
Budget	0%	20%	0%	20%	0%	0%	0%

The adoption of robotics in F&B functions across all seven cities is low, with the majority of hotels indicating zero adoption. However, Bangkok, Hong Kong, Kuala Lumpur, and Singapore have adopted robotics as part of their hotel F&B processes. Overall, hotels in Bangkok have the highest 20% adoption of robotics in F&B functions. Examples of robotics tools used in the F&B segment include cutlery polishers and egg cooker robotics.

The adoption of robotics in F&B may serve only as a novelty for industry forerunners. However, the technology may not be able to support overall back-of-house operations due to the complexity of cuisines and diverse customer palettes, and dietary needs. Besides, hotel managers have negative sentiments toward the adoption of robotics for the F&B segment. Currently, most robots are only able to perform basic commands and are unable to replicate high-level culinary skills. Hence, investment in robotics for the F&B segment may not add value to the department's overall operations.

Robotics Process Automation (RPA)

TABLE 115

ADOPTION RATE OF RPA FOR FOOD AND BEVERAGE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	5%	15%	5%	9%	5%	0%	0%
Luxury	0%	0%	17%	20%	0%	0%	0%
Upscale	0%	20%	0%	0%	0%	0%	0%
Mid-tier	0%	40%	0%	0%	0%	0%	0%
Budget	20%	0%	0%	20%	20%	0%	0%

The adoption of RPA in F&B functions is relatively low, ranging between 5% and 15%. RPA enables automatic generation of purchase orders once food inventory levels reach the minimum forecast thresholds. The deployment of RPA tools increases efficiency by reducing additional procurement steps and enhancing the accuracy and timeliness of food delivery. Despite the technology's benefits, adoption rates are low across all hotels, except in Bangkok and Kuala Lumpur due to higher customer volumes in their F&B segment.

Video Analytics

TABLE 116

ADOPTION RATE OF VIDEO ANALYTICS FOR FOOD AND BEVERAGE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	0%	20%	19%	14%	20%	20%	22%
Luxury	0%	20%	33%	40%	0%	20%	13%
Upscale	0%	20%	20%	0%	0%	40%	20%
Mid-tier	0%	20%	20%	0%	20%	20%	0%
Budget	0%	20%	0%	20%	60%	0%	60%

Video analytics in the F&B segment is applied for the facial recognition of hotel guests. Also, the technology is applicable in back-of-house operations to sort cutlery, as well as for crowd management. The adoption of video analytics for F&B functions in hotels remains low, ranging between 14% and 20% across all cities and tiers, except Singapore which has zero adoption.

Artificial Intelligence (AI) and Machine Learning (ML)

TABLE 117

ADOPTION RATE OF AI AND ML FOR FOOD AND BEVERAGE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	5%	20%	10%	9%	25%	25%	30%
Luxury	0%	20%	33%	20%	0%	20%	13%
Upscale	0%	20%	0%	0%	0%	60%	20%
Mid-tier	20%	20%	0%	0%	40%	20%	20%
Budget	0%	20%	0%	20%	60%	0%	80%

Overall, the adoption of AI and ML technologies in F&B across all tiers of hotels ranges between 5% and 30%. City-wise, Hong Kong, Seoul, and Tokyo have adoption rates of 25% and above. The adoption of AI and ML across hotels in Bangkok, Kuala Lumpur, Singapore, and Taipei ranges between 5% and 20%. In terms of usage, AI and ML can be incorporated into food waste management, where AI can detect and record the type and amount of food items discarded. Hotel chefs and F&B managers can analyze this data to ascertain the right quantities and the types of ingredients required to reduce food wastage and improve cost savings.

Singapore sees the lowest adoption rate for AI and ML due to the lack of any incentives and initiatives to enhance productivity improvement through technology.

Breakfast Tracking

TABLE 118

ADOPTION RATE OF BREAKFAST TRACKING TOOL FOR FOOD AND BEVERAGE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	15%	40%	29%	23%	25%	15%	17%
Luxury	20%	60%	33%	20%	40%	0%	13%
Upscale	40%	20%	40%	20%	20%	0%	20%
Mid-tier	0%	40%	20%	29%	20%	40%	40%
Budget	0%	40%	20%	20%	20%	20%	0%

The adoption of breakfast tracking tools ranges between 15% and 40% in hotels across all tiers and cities. The breakfast tracking solution enables F&B outlets to retrieve guests' entitlement and consumption status by tapping key cards on digital readers, which reconciles charges automatically at the end of each breakfast service. The solution helps in reducing guest dining queues and improving F&B staff productivity as end-of-day reconciliation is not required. In addition, the technology provides real-time analytics on consumption.

Across the board, hotels in Bangkok, Hong Kong, and Taipei have the highest adoption of breakfast tracking tools as their hotels view F&B as a crucial source of revenue to compensate for low occupancy rates. Hence, increasing productivity is necessary to ensure that the F&B department continues to generate healthy revenue flow, profitability, and customer loyalty.

Online Reservation and Ordering

TABLE 119

ADOPTION RATE OF ONLINE RESERVATION AND ORDERING SOLUTION FOR FOOD AND BEVERAGE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	45%	65%	33%	50%	70%	70%	78%
Luxury	60%	80%	33%	80%	80%	40%	63%
Upscale	60%	80%	40%	60%	60%	100%	80%
Mid-tier	40%	60%	60%	29%	80%	100%	100%
Budget	20%	40%	0%	40%	60%	40%	80%

The adoption of online reservation and ordering solutions is relatively high in hotels across all cities, with an average rate of 59%. Across different tiers, hotels in luxury, upscale, and mid-tier segments have a high average adoption rate of 60% and above. However, the budget hotels in Singapore have low adoption of the solution while Taipei has zero adoption as many of these hotels do not have F&B departments. The adoption of online reservation and ordering tools is widespread across all hotels with F&B departments due to the increasing availability of different mobile applications like Eatigo and Chope, which have helped to increase the number of covers. These tools allow hotel restaurants to maximize capacity and generate additional revenue.

Mobile-ordering for Crew

TABLE 120

ADOPTION RATE OF MOBILE ORDERING SYSTEM FOR CREW FOR FOOD AND BEVERAGE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	15%	45%	19%	41%	70%	55%	61%
Luxury	20%	80%	33%	80%	60%	40%	38%
Upscale	40%	20%	20%	40%	60%	100%	40%
Mid-tier	0%	40%	20%	29%	100%	60%	80%
Budget	0%	40%	0%	20%	60%	20%	100%

Hotels across all cities, except in Singapore, have a relatively high adoption of mobile ordering systems for the crew, with an average of 44% across all cities. Both Hong Kong and Seoul have 100% adoption in the upscale and mid-tier hotel segments. The use of mobile ordering for crew solutions enables employees to take orders and complete the payment process at the guest's table. The benefits and impact of this technology include streamlining order-taking and payment processes for F&B crews, optimizing manpower by reducing trips to the POS or kitchen, and eliminating ordering errors. Many hotel respondents agree that mobile ordering for crew minimizes room for error and reduces the number of trips, both of which enhance overall F&B efficiency and productivity.

Table Queue Management

TABLE 121

ADOPTION RATE OF TABLE QUEUE MANAGEMENT SYSTEM FOR FOOD AND BEVERAGE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	20%	40%	38%	18%	45%	45%	48%
Luxury	40%	40%	50%	40%	60%	40%	38%
Upscale	40%	20%	60%	20%	20%	100%	40%
Mid-tier	0%	60%	40%	14%	40%	40%	40%
Budget	0%	40%	0%	0%	60%	0%	80%

Table queue management is an electronic system for tracking table booking and occupancy. It is used to simplify table management, streamline service operations, and reduce business operating costs. The adoption rate for table queue management systems ranges between 18% (Kuala Lumpur) and 48% (Tokyo). Across all tiers, the adoption rates are highest in luxury and upscale hotels. Two brands of table queue management systems are QLess and Tables Ready.

Power-assisted Delivery

TABLE 122

ADOPTION RATE OF POWER-ASSISTED DELIVERY SOLUTION FOR FOOD AND BEVERAGE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	10%	15%	10%	18%	45%	35%	39%
Luxury	20%	40%	17%	40%	60%	20%	25%
Upscale	20%	0%	0%	20%	20%	100%	20%
Mid-tier	0%	20%	20%	14%	60%	20%	20%
Budget	0%	0%	0%	0%	40%	0%	100%

The current adoption rate for power-assisted delivery solutions in the F&B segment is largely in line with its adoption in the housekeeping department. Among the cities, hotels in Hong Kong, Seoul, and Tokyo are at the top of the list with adoption of 35% and more. Drawing from this analysis, these cities are likely more inclined to adopt new technologies due to their higher risk appetite. To mitigate high manpower costs, hotels in these cities rely heavily on technology to reduce their overall reliance on a human workforce. In contrast, Singapore continues to exhibit low adoption rates as hotels there are risk-averse and have little inclination towards digital transformation.

Data Analytics for Resource Optimization

TABLE 123

ADOPTION RATE OF DATA ANALYTICS FOR RESOURCE OPTIMIZATION FOR FOOD AND BEVERAGE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	10%	30%	33%	14%	45%	45%	39%
Luxury	20%	20%	50%	20%	40%	60%	25%
Upscale	20%	0%	40%	20%	40%	100%	40%
Mid-tier	0%	80%	40%	14%	40%	20%	20%
Budget	0%	20%	0%	0%	60%	0%	80%

Using this technology, F&B managers can analyze market trends, seasonal demands, and guest preferences to provide actionable productivity improvement plans and generate new revenue. Business intelligence and CRM tools are commonly adopted to understand customer profiles. The benefit of using such technologies is that hotels can streamline business processes and store customer data to improve customer satisfaction. Comparisons made with Table 109, Data Analytics for Resource Optimization for Housekeeping, reveal that both Singapore and Kuala Lumpur exhibit low adoption rates for data analytics for resource optimization for both functions.

Food Management

TABLE 124

ADOPTION RATE OF FOOD MANAGEMENT TECHNOLOGY FOR FOOD AND BEVERAGE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	10%	35%	10%	32%	40%	55%	65%
Luxury	20%	40%	17%	20%	40%	40%	38%
Upscale	20%	0%	20%	60%	20%	100%	60%
Mid-tier	0%	40%	0%	29%	60%	60%	80%
Budget	0%	60%	0%	20%	40%	20%	100%

Food management technologies leverage AI to monitor food availability within buffet setups and trigger replenishment commands. Through the adoption of food management tools, hotels can provide on-time food delivery services and ascertain food inventory levels to optimize replenishing them and thus minimize food wastage. Overall, hotels in Hong Kong, Seoul, and Tokyo have the highest adoption rates of 40% and more of food management technologies across functions in F&B. In contrast, Singapore and Taipei have the lowest adoption rates at 10% each.

Crowd Management

TABLE 125

ADOPTION RATE OF CROWD MANAGEMENT TOOL FOR FOOD AND BEVERAGE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	10%	20%	5%	23%	50%	40%	43%
Luxury	20%	20%	17%	20%	20%	20%	13%
Upscale	20%	0%	0%	40%	40%	100%	40%
Mid-tier	0%	20%	0%	14%	80%	40%	40%
Budget	0%	40%	0%	20%	60%	0%	100%

Crowd management tools leverage video analytics to help users understand queue patterns at F&B outlets, especially during peak hours. Through the adoption of this technology, restaurants can better manage queues by re-directing guests or deploying more staff to optimize operations. Across the cities, hotels in Hong Kong, Seoul, and Tokyo have the highest adoption of crowd management solutions. Since mid-tier and budget hotels in the two cities experience higher customer traffic as compared to luxury and upscale hotels, they need to manage crowds and enhance queue efficiency, resulting in higher adoption rates.

In contrast, Bangkok, Singapore, Kuala Lumpur, and Taipei have a lower implementation of crowd management tools due to the availability of a large labor pool. Singapore's reliance on foreign labor gives it a competitive advantage over the developed cities where the increasing level of education has reduced the size of labor pools in intensive roles.

Delivery Robots

TABLE 126

ADOPTION RATE OF DELIVERY ROBOTS FOR FOOD AND BEVERAGE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	0%	0%	5%	0%	5%	5%	0%
Luxury	0%	0%	17%	0%	20%	20%	0%
Upscale	0%	0%	0%	0%	0%	0%	0%
Mid-tier	0%	0%	0%	0%	0%	0%	0%
Budget	0%	0%	0%	0%	0%	0%	0%

Delivery robots can help augment limited manpower, reduce operating costs, and increase performance efficiency across the F&B department. However, such robots also eliminate customer interaction. This is the major reason for their low uptake, with only Hong Kong, Seoul, and Taipei adopting it at 5%. F&B settings are largely volatile, marked by unpredictable movement and interaction between guests and service crews. As such, the investment costs may outweigh the benefits of implementing delivery robots.

Technology Adoption Rate across Cities (Engineering)

Delving into the use of technologies for streamlining engineering functions, it is noted that hotels across cities widely adopt Building Management systems to enhance energy efficiency and resource optimization. Overall, hotels in Singapore have the highest adoption rate at 75%, reiterating the city's preference for leveraging back-end technologies to increase productivity. Similarly, other developed cities have a higher adoption rate in comparison rest of the cities under this study.

TABLE 127

OVERALL TECHNOLOGY ADOPTION (ENGINEERING).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Building Management	75%	50%	48%	41%	65%	60%	57%
Data Analytics for Energy Optimization	45%	40%	57%	36%	60%	50%	48%
IoT-based Maintenance HVACs and Hotel Assets	45%	5%	29%	41%	70%	55%	65%

Note: HVAC, Heating, Ventilation, and Air-conditioning.

Building Management

TABLE 128

ADOPTION RATE OF BUILDING MANAGEMENT SOLUTION FOR ENGINEERING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	50%	75%	48%	41%	65%	60%	57%
Luxury	80%	80%	50%	20%	60%	80%	25%
Upscale	60%	80%	60%	40%	60%	100%	60%
Mid-tier	60%	80%	40%	43%	80%	60%	60%
Budget	0%	60%	40%	60%	60%	0%	100%

Building management solutions allow centralized control and monitoring of a hotel's mechanical and electrical equipment. It helps to optimize energy usage and reduce operational costs, extend equipment lifespans, and provide real-time status of equipment. Overall, the engineering department across hotel segments has a relatively high adoption rate for building management solutions, ranging between 48% and 75%. Across the tiers, luxury, upscale, and mid-tier hotels see higher adoption of building management systems than budget hotels. Hotels leverage building management systems by integrating technologies such as digitized and centralized air-conditioning chiller plant management systems, building sensors, and IoT solutions to reduce electricity and energy wastage.

Data Analytics for Energy Optimization

TABLE 129

ADOPTION RATE OF DATA ANALYTICS FOR ENERGY OPTIMIZATION FOR ENGINEERING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	40%	45%	57%	36%	60%	50%	48%
Luxury	60%	60%	67%	40%	60%	60%	38%
Upscale	60%	40%	80%	60%	20%	100%	40%
Mid-tier	40%	40%	40%	29%	80%	40%	20%
Budget	0%	40%	40%	20%	80%	0%	100%

Data analytics for energy optimization provide the analysis of hotel equipment, such as HVAC systems to reduce energy consumption. The integration of these tools allows hotels to understand how energy is used and consumed. It also helps to ascertain and optimize energy usage and unlock the insights needed to reduce energy consumption. High levels of adoption are observed across all cities, except Kuala Lumpur. The study indicates that every hotel tier has adopted data analytics for energy optimization, except budget hotels in Seoul and Singapore. Common tools are building management systems and integrated smart room systems.

IoT-based Maintenance System for HVAC and Hotel Assets

TABLE 130

ADOPTION RATE OF IOT-BASED MAINTENANCE SYSTEM FOR HVAC AND HOTEL ASSETS FOR ENGINEERING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	5%	45%	29%	41%	70%	55%	65%
Luxury	0%	40%	33%	40%	60%	40%	38%
Upscale	20%	40%	60%	60%	60%	100%	60%
Mid-tier	0%	60%	20%	43%	100%	60%	80%
Budget	0%	40%	0%	20%	60%	20%	100%

By using IoT-based maintenance solutions, hotels can track and enhance their management of HVAC and hotel assets. The deployment of this technology enables hotels to optimize resource management and preventive maintenance. Hence, the adoption of IoT-based maintenance systems is high across the board, except for Singapore. In terms of hotel tiers, upscale and mid-tier hotels see the highest implementation of IoT-based maintenance for HVAC systems and hotel assets. The integration of such technologies requires cooperation from various departments, including building management, security, IT, and engineering, which may be a key deterrent for hotels in Singapore.

Technology Adoption Rate across Cities (Security)

Security is of utmost priority for all hotels and the study indicates a high penetration of CCTV security Analytics across all cities, except Bangkok. However, the visitor management system has a lower rate of adoption in developing cities and Singapore. As observed, compared to other developed cities, Singapore has a lower adoption rate for such security technology tools due to the nation's stability and security as well as its availability of manpower with the right skillsets. It is noted that most of the security posts in Singapore are taken up by retirees.

TABLE 131

OVERALL TECHNOLOGY ADOPTION (SECURITY).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
CCTV Security Analytics	65%	45%	76%	68%	90%	90%	83%
Visitor Management	45%	30%	43%	45%	60%	75%	70%

Note: CCTV, Closed-circuit Television.

CCTV Security Analytics

TABLE 132

ADOPTION RATE OF CCTV SECURITY ANALYTICS FOR SECURITY FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	45%	65%	76%	68%	90%	90%	83%
Luxury	60%	80%	83%	80%	80%	80%	63%
Upscale	40%	60%	80%	80%	80%	100%	80%
Mid-tier	60%	80%	60%	57%	100%	100%	100%
Budget	20%	40%	80%	60%	100%	80%	100%

The use of smart CCTV monitoring helps hotels automate CCTV surveillance of their premises, which reduces the need for physical monitoring and investigation, provides insights on areas that require special attention, and helps security teams anticipate potential threats. Across the board, the adoption of CCTV security analytics is high in all cities, particularly in Hong Kong and Seoul. However, hotels in Singapore are low on the integration of CCTV security analytics integration as the country is well-known for its overall security and safety. In addition, a majority of security staff holding such positions in Singapore are foreign workers or retirees. Hence, wages are relatively low and manpower is widely available, reducing the need for investment in security technologies in the city.

Visitor Management

TABLE 133

ADOPTION RATE OF VISITOR MANAGEMENT FOR SECURITY FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	30%	45%	43%	45%	60%	75%	70%
Luxury	20%	80%	50%	60%	60%	60%	50%
Upscale	60%	20%	60%	60%	40%	100%	40%
Mid-tier	40%	40%	40%	29%	80%	100%	100%
Budget	0%	40%	20%	40%	60%	40%	100%

The adoption of visitor management tools enables digital registration and monitoring of visitors, including suppliers, contractors, etc. within hotel premises to enhance security and streamline visitor tracking. Hotels in Hong Kong, Seoul, and Tokyo have the highest adoption rates of 60% and more for visitor management systems. Singapore continues to lag in technology use with just 30% adoption of visitor management tools across all tiers of hotels in the city.

Technology Adoption Rate across Cities (Sales & Marketing)

Deep diving into Sales & Marketing, the study observes that hotels in Singapore have the highest penetration rate across Revenue Management Systems (RMS), reputation management and social listening tools, MICE Sales and Event Management, and MICE Group Reservations Management. Similarly, Hong Kong, Seoul, and Tokyo have high adoption of revenue management, reputation management, and social listening tools. In comparison to other developed cities that concentrate on the use of technology to reduce manpower-related operations, Singapore is focused on data-centric automation to streamline back-end processes. Events Layout Automation (ELA), Augmented Reality (AR), and Virtual Reality (VR) for visualization had the lowest adoption rate during the five years in the pre-pandemic era.

TABLE 134

OVERALL TECHNOLOGY ADOPTION (SALES & MARKETING).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
RMS	80%	50%	57%	50%	85%	60%	78%
Reputation Management and Social Listening Tool	75%	40%	62%	50%	60%	55%	70%
GDS	55%	50%	48%	45%	70%	15%	52%
ELA	45%	15%	10%	23%	55%	40%	48%
MICE Sales and Event Management	70%	30%	43%	32%	55%	35%	39%
MICE Group Reservations Management	60%	10%	29%	27%	50%	25%	30%
AR/VR for Visualization	25%	20%	10%	23%	50%	40%	48%

Note: GDS, Global Distribution System.

Revenue Management System (RMS)

TABLE 135

ADOPTION RATE OF RMS FOR SALES & MARKETING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	50%	80%	57%	50%	85%	60%	78%
Luxury	80%	80%	33%	40%	80%	60%	63%
Upscale	60%	80%	80%	40%	80%	100%	80%
Mid-tier	60%	100%	60%	71%	100%	60%	80%
Budget	0%	60%	60%	40%	80%	20%	100%

RMS analyzes guest reservation data and demand trends to help hotels optimize pricing. Thus, RMS supports productivity improvement by gathering insights on market trends to increase hotel competitiveness and maximize revenue. Key technologies such as customer relationship management and profiling, as well as the database of customer profiles, help hotels achieve the following customer retention strategies. As indicated in Table 135, hotels in Bangkok and Hong Kong have a high RMS adoption rate of 80% and above. Singapore has a lower average adoption rate since budget hotels in the city have no RMS deployment at all.

Reputation Management and Social Listening Tool

TABLE 136

ADOPTION RATE OF REPUTATION MANAGEMENT AND SOCIAL LISTENING TOOLS FOR SALES & MARKETING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	40%	75%	62%	50%	60%	55%	70%
Luxury	60%	80%	50%	40%	80%	60%	50%
Upscale	80%	100%	60%	60%	0%	100%	80%
Mid-tier	20%	60%	60%	57%	100%	60%	80%
Budget	0%	60%	80%	40%	60%	0%	80%

Reputation management and social listening tool tracks and monitors the overall sentiment towards a brand/company across multiple social media platforms. It helps hotels provide timely responses to best manage their reputation across multiple social channels. By leveraging this tool, hotels gain awareness of customer sentiment, build trust and enhance their social reputation, gain an understanding of customer needs and demands, and improve customer service and touchpoints. Two brands that offer this technology include BrandGain Reputation Management System and X3nia (Guest Experience Management System).

Hotels across the tiers in Bangkok, Taipei, and Tokyo have high levels of adoption at 62% and above, whereas Singapore and Seoul have lower adoption rates of 40% and 55%, respectively. Hotels across all seven cities have reported that the collection of customer feedback is integral to strategy building and process improvement. Hotels in Singapore leverage chatbots, in-house surveys, and consultancy reports as their reputation management and social listening tools to ascertain consumer sentiment and brand reputation.

Global Distribution System (GDS)

TABLE 137

ADOPTION RATE OF GDS FOR SALES & MARKETING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	50%	55%	48%	45%	70%	15%	52%
Luxury	80%	40%	67%	40%	80%	20%	25%
Upscale	80%	60%	40%	60%	40%	20%	80%
Mid-tier	40%	40%	80%	57%	80%	20%	40%
Budget	0%	80%	0%	20%	80%	0%	80%

A global distribution system links services, rates, and bookings across the travel industry, to enable transactions among service providers. These include service providers like airlines, hotels, car rental companies, and travel agencies. Through the use of GDS, hotels can offer bundled packages on air travel, hotel stay, and other forms of destination promotion. This approach enables hotels to reach a wider target audience and generate more income. Hotels across all cities and tiers have high adoption of this technology, except Seoul. As specified in the chapter on Seoul , instead of leveraging the GDS hotels in the city work with their internal sales and marketing team to devise promotional bundles. CRM tools and property management systems are also integrated to utilize GDS, which translates into effective marketing strategies that capture high market share.

Events Layout Automation (ELA)

TABLE 138

ADOPTION RATE OF ELA FOR SALES & MARKETING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	15%	45%	10%	23%	55%	40%	48%
Luxury	20%	60%	17%	40%	60%	20%	25%
Upscale	0%	40%	0%	40%	20%	80%	40%
Mid-tier	20%	20%	0%	14%	80%	40%	40%
Budget	20%	60%	20%	0%	60%	20%	100%

Event layout automation tools enable accurate and collaborative digital diagramming of suitable layouts for a venue, including capacity. Using this tool, hotels gain better visibility that unlocks insights to drive sales and promote productivity. The tool also helps in effective event planning and coordination. The sales and marketing departments in hotels across Bangkok, Hong Kong, Seoul, and Tokyo exhibit high levels of adoption at 40% and above. Hotels in these four cities, particularly in Bangkok, have reported that meeting, incentive travel, conferences, and exhibitions (MICE) business account for their largest revenue streams. Hence, the adoption of event layout automation solutions is crucial to facilitate better operational processes. Across hotel tiers, luxury hotels have the highest adoption rates in all seven cities.

MICE Sales and Event Management

TABLE 139

ADOPTION RATE OF MICE SALES & EVENT MANAGEMENT SOLUTION FOR SALES & MARKETING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	30%	70%	43%	32%	55%	35%	39%
Luxury	80%	80%	50%	40%	60%	40%	38%
Upscale	20%	80%	40%	20%	40%	60%	60%
Mid-tier	20%	60%	60%	43%	60%	40%	20%
Budget	0%	60%	20%	20%	60%	0%	40%

MICE sales and event management solutions seamlessly drive new business revenue by efficiently managing guest room inventory and communicating event details across departments. This digital tool enables effective client management and operational transparency, thus increasing productivity through automated task management and workflow. Bangkok and Hong Kong, both known as business hubs in the region, have high levels of adoption of MICE sales and event management solutions across all hotel tiers at 70% and 55%, respectively. Although hotels in Singapore show low levels of adoption for event layout automation, they have high adoption rates for MICE sales and event management tools, especially in the luxury tier (80%), as the city hosts many conventions and summits.

MICE Group Reservations Management

TABLE 140

ADOPTION RATE OF MICE GROUP RESERVATION MANAGEMENT SOLUTION FOR SALES & MARKETING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	10%	60%	29%	27%	50%	25%	30%
Luxury	40%	60%	17%	40%	60%	40%	25%
Upscale	0%	60%	40%	0%	20%	20%	40%
Mid-tier	0%	40%	40%	43%	60%	40%	0%
Budget	0%	80%	20%	20%	60%	0%	60%

MICE group reservation management solution enables customization of partners' event booking microsites to connect the hotel directly with event delegates. It allows automated and efficient workflow for contracting, upselling, rooming, and tracking reservation rates. Overall, hotels in Bangkok and Hong Kong across tiers report high adoption rates of 60% and 50%, respectively, for MICE group reservation management solutions.

Augmented Reality (AR) and Virtual Reality (VR) for Visualization

TABLE 141

ADOPTION RATE OF AR/VR TOOL FOR VISUALIZATION FOR SALES & MARKETING FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	20%	25%	10%	23%	50%	40%	48%
Luxury	40%	60%	17%	40%	40%	40%	50%
Upscale	20%	20%	20%	40%	40%	100%	20%
Mid-tier	20%	20%	0%	0%	80%	20%	20%
Budget	0%	0%	0%	20%	40%	0%	100%

The use of augmented reality and virtual reality for visualization provides potential hotel guests realistic and interactive view of the property. Technologies such as 360-degree video are adopted to provide quality customer experiences, triggering purchases and increasing consumer confidence. Hotels in Hong Kong, Seoul, and Tokyo have the highest adoption of AR/VR tools at 40% and above due to their higher appetite for technology adoption as compared to the other cities surveyed under this study.

Technology Adoption Rate across Cities (Finance)

TABLE 142

OVERALL TECHNOLOGY ADOPTION (FINANCE).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
RFID Asset Tracking	40%	15%	24%	18%	30%	25%	30%
Cloud-based Accounting	75%	40%	48%	45%	65%	45%	78%

RFID Asset Tracking

TABLE 143

ADOPTION RATE OF RFID ASSET TRACKING SYSTEM FOR FINANCE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	15%	40%	24%	18%	30%	25%	30%
Luxury	40%	40%	33%	60%	40%	40%	13%
Upscale	20%	20%	20%	0%	0%	20%	40%
Mid-tier	0%	40%	40%	14%	40%	40%	40%
Budget	0%	60%	0%	0%	40%	0%	40%

The finance department in hotels uses RFID asset tracking systems to electronically trace assets and collect data in real-time to streamline operational processes and for accounting and reporting purposes. Hotels across the cities indicate moderate-to-low levels of adoption of RFID asset tracking systems, ranging between 15% and 30%. Of the cities, hotels in Bangkok, Hong Kong, Seoul, and Tokyo have the highest levels of adoption .

Cloud-based Accounting Management

TABLE 144

ADOPTION RATE OF CLOUD-BASED ACCOUNTING MANAGEMENT FOR FINANCE FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	40%	75%	48%	45%	65%	45%	78%
Luxury	60%	80%	33%	60%	80%	40%	75%
Upscale	40%	40%	60%	60%	40%	100%	80%
Mid-tier	40%	40%	40%	43%	60%	40%	60%
Budget	20%	60%	60%	20%	80%	0%	100%

Cloud-based accounting management simplifies financial operations across the hotel. This process allows for automated calculation and administrative procedures. The cloud-based accounting management solution also enables real-time reporting and visibility. Overall, hotels across all cities and tiers have a high adoption rate for this back-end technology, in the range of 40% to 78%. In particular, hotels in Bangkok, Hong Kong, and Tokyo witness the highest levels of adoption. By tier, the luxury and upscale hotels have the highest levels of adoption as compared to the other tiers, indicating higher adoption rates of tools for back-end operations.

Technology Adoption Rate across Cities (Human Resource)

Delving into the level of technology adoption to support human resource efforts, the study noted a higher preference for solutions that could improve employee communication, time and attendance, and e-learning among hotels in developed cities. The adoption of technology tools for human resource applications in hotels seems to be lower due to the prioritization of tasks and duties. As such, new tools such as Labor Scheduling and Candidate Management are seen to have lower adoption in comparison to other technological tools.

TABLE 145

OVERALL TECHNOLOGY ADOPTION (HUMAN RESOURCES).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Employee Communication	65%	20%	57%	45%	75%	75%	74%
Time and Attendance	80%	65%	65%	73%	65%	80%	83%
E-learning	80%	50%	48%	36%	50%	25%	30%
Foreign Worker Accommodation Management	25%	5%	14%	18%	40%	30%	30%
Labour Scheduling	45%	20%	29%	32%	40%	50%	83%
Candidate Management	35%	15%	14%	14%	45%	15%	13%

Employee Communication

TABLE 146

ADOPTION RATE OF EMPLOYEE COMMUNICATION TOOL FOR HR FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	20%	65%	57%	45%	75%	75%	74%
Luxury	20%	80%	67%	80%	60%	60%	50%
Upscale	40%	60%	40%	40%	60%	100%	60%
Mid-tier	0%	80%	40%	29%	100%	100%	100%
Budget	20%	40%	80%	40%	80%	40%	100%

Employee communication tools enable real-time unified communication across a workforce and allow secure one-to-one and group messaging, content management, engagement analytics, and employee surveys. High levels of adoption are seen in hotels across the board, with an average of 59%. Of the cities, hotels in Hong Kong, Seoul, and Tokyo report the highest levels of adoption due to their emphasis on employee communication to inform them of best practices that support productivity improvement and help advance and upskill the workforce. Similarly, luxury and upscale hotels have the highest levels of adoption, signifying the importance that these hotels lay on employee communication to ensure real-time updates and process efficiency.

Time and Attendance

TABLE 147

ADOPTION RATE OF TIME AND ATTENDANCE TRACKING SYSTEM FOR HR FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	65%	80%	65%	73%	65%	80%	83%
Luxury	80%	80%	50%	80%	60%	80%	75%
Upscale	80%	80%	60%	80%	60%	100%	80%
Mid-tier	60%	60%	100%	71%	60%	100%	100%
Budget	40%	100%	40%	60%	80%	40%	80%

Time and attendance tracking systems allow hotels to digitally log employee clock-in and clock-out via the use of biometrics, such as facial and fingerprint recognition, and to facilitate work schedules, payroll, and productivity management. Across the board, hotels in all cities have reported high adoption levels of 65% to 83% for this technology.

e-Learning

TABLE 148

ADOPTION RATE OF E-LEARNING PLATFORM FOR HR FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	50%	80%	48%	36%	50%	25%	30%
Luxury	80%	80%	33%	20%	80%	40%	25%
Upscale	80%	100%	80%	20%	20%	0%	40%
Mid-tier	40%	60%	40%	43%	60%	40%	60%
Budget	0%	80%	40%	60%	40%	20%	0%
Average	50%	80%	48%	36%	50%	25%	31%

Hotels use e-Learning platforms to provide employees with an online educational experience where they can conveniently log in to access training courses via a computer or smart device. The technology allows employees anytime access to training materials and customizable content, depending on their job role and scope. This reduces the need for face-to-face (F2F) interaction, especially pertinent during the COVID-19 pandemic. However, the adoption rate of e-Learning solutions varies across the hotel tiers, and by city.

Overall, hotels in Bangkok stand out for their focus on talent development, as reflected by their adoption rate of 80% for e-Learning platforms. This high adoption rate can be attributed to the city's diverse talent pool that lacks industry knowledge as the majority of employees come from rural areas and initially may not be digitally literate enough to undertake or perform their required tasks. Singapore sees high levels of adoption in the luxury and upscale hotels due to their prioritization of service quality and employee upskilling.

Foreign Worker Accommodation Management

TABLE 149

ADOPTION RATE OF FOREIGN WORKER ACCOMMODATION MANAGEMENT SOLUTION FOR HR* FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	5%						
Luxury	20%						
Upscale	0%						
Mid-tier	0%						
Budget	0%						

* This technology system applies only to Singapore

As hotels in Singapore employ a large number of foreign workers, the foreign worker accommodation management solution helps hotels comply with the foreign worker housing regulations established by the Ministry of Manpower. Nonetheless, Singapore has a low average adoption rate of 5% across all tiers, with only 20% penetration among luxury hotels.

Labor Scheduling

TABLE 150

ADOPTION RATE OF LABOR SCHEDULING TOOL FOR HR FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	20%	45%	29%	32%	40%	50%	83%
Luxury	40%	60%	33%	40%	20%	40%	75%
Upscale	0%	20%	20%	60%	40%	100%	80%
Mid-tier	20%	20%	20%	29%	60%	60%	80%
Budget	20%	80%	40%	0%	40%	0%	100%

Labor scheduling tools automate workforce forecasting and manage shift scheduling by enabling real-time updates of employee rosters. These solutions mitigate errors in planning for manpower needs, minimize work scheduling conflicts, and increase productivity for managers.

Hotel managers report that Labor scheduling tools help improve the overall productivity of their human resources team by optimizing manpower deployment and man-hours required per shift. Labor scheduling is often used by hotels with minimal outsourcing capabilities.

Overall, the adoption of labor scheduling tools in hotels across seven cities varies between 20% and 83%. Across all cities, Singapore sees the lowest adoption rate at 20% while Bangkok, Seoul, and Tokyo witness the highest adoption rates. By tier, upscale and mid-tier hotels have the highest adoption rates of 46% and 41%, respectively.

TABLE 151

ADOPTION RATE OF CANDIDATE MANAGEMENT SOLUTION FOR HR FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	15%	35%	14%	14%	45%	15%	13%
Luxury	40%	60%	17%	20%	60%	0%	13%
Upscale	0%	20%	20%	60%	40%	100%	80%
Mid-tier	20%	20%	20%	29%	60%	60%	80%
Budget	20%	80%	40%	0%	40%	0%	100%

Candidate management solutions leverage AI to identify talent and map behavioral assessments of candidates. These tools support and streamline the hotel's hiring process, enabling more effective decision-making. However, hotels across the board have low adoption of candidate management solutions, except in Hong Kong at 45%. HR uses candidate management tools to identify and segment potential candidates through a funnel approach, enabling data analytics-derived insights for hiring decisions. While the tool may speed up the hiring process, the act of vetting candidates requires qualitative skills to ascertain many factors. As such, the technology may not have the acumen to consider intangible factors such as interpersonal skills and team fit.

Technology Adoption Rate across Cities (Others)

Prevalent technology tools such as CRM have seen a high level of penetration across developed cities. Developing cities, particularly Bangkok, witnesses a lower level of adoption due to low technology diffusion as well as a lack of technological literacy which inhibits hoteliers from adopting new solutions.

TABLE 152

OVERALL TECHNOLOGY ADOPTION (OTHERS).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
CRM	85%	30%	52%	55%	85%	60%	91%
IoT-enabled Inventory Management	35%	15%	43%	41%	50%	45%	61%
Data Analytics for Financial Forecasting and Budgeting	45%	25%	29%	45%	65%	50%	65%

Customer Relationship Management (CRM)

TABLE 153

ADOPTION RATE OF CRM SOLUTION FOR OTHER FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	30%	85%	52%	55%	85%	60%	91%
Luxury	40%	60%	50%	80%	80%	60%	75%
Upscale	40%	100%	60%	40%	80%	100%	100%
Mid-tier	40%	100%	60%	57%	100%	60%	100%
Budget	0%	80%	40%	40%	80%	20%	100%

CRM solution is crucial for identifying market trends and opportunities and it is adopted widely in many industries to identify sales leads and business development opportunities. Through the use of CRM, hotels can analyze their customer profiles and customer database. Across the board, hotels have high adoption levels of CRM at an average rate of 65%, except in Singapore which stands at an average 30% level. Of the tiers, upscale and mid-tier hotels have the highest penetration rates, with an average of 74% each.

IoT-enabled Inventory Management

TABLE 154

ADOPTION RATE OF IOT-ENABLED INVENTORY MANAGEMENT TOOL FOR OTHER FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	15%	35%	43%	41%	50%	45%	61%
Luxury	0%	40%	33%	60%	60%	20%	50%
Upscale	20%	40%	20%	60%	20%	100%	40%
Mid-tier	20%	20%	60%	29%	80%	60%	60%
Budget	20%	40%	20%	20%	40%	0%	100%

IoT-enabled inventory management tools give hotels the means to track and better understand their inventory status, as well as automate purchases when required. These solutions eliminate steps from the procurement process, enabling just-in-time inventory and thereby minimizing losses. Across the board, Singapore has the lowest adoption of IoT-enabled inventory management tools (15%) whereas Hong Kong and Tokyo have high adoption rates of 50% and 61%, respectively.

Data Analytics for Financial Forecasting and Budgeting

TABLE 155

ADOPTION RATE OF DATA ANALYTICS FOR FINANCIAL FORECASTING AND BUDGETING FOR OTHER FUNCTIONS.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Total	25%	45%	29%	45%	65%	50%	65%
Luxury	40%	40%	17%	60%	60%	60%	50%
Upscale	20%	40%	20%	60%	40%	100%	60%
Mid-tier	40%	40%	20%	29%	100%	40%	60%
Budget	0%	60%	0%	40%	60%	0%	100%

Data analytics for financial forecasting and budgeting enables hotels to ascertain room reservation data and demand trends, accurately forecast and budget financials, and automatically submit daily financial reports. Through data analytics, hotels can improve productivity, reduce errors, and gain insights into financial trends. Of the cities, hotels in Hong Kong, Seoul, and Tokyo have high adoption of data analytics tools ranging between 50% to 65%. On the contrary, hotels in Singapore and Taipei see low levels of participation due to no acceptance by budget hotels. Taipei is noted to have a lower level of participation across all tiers, indicating low levels of back-end system integration.

Comparison of Profitability Indicators by City Level across Five Years (2015 to 2019)

Profitability Indicator: Average Room Rate (ARR)

TABLE 156

OVERALL AVERAGE ROOM RATE (IN USD)*.

	Bangkok	Singapore	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	141	207	158	119	169	160	186
2016	136	202	154	125	178	164	230
2017	144	197	152	116	177	159	226
2018	149	193	145	131	194	154	255
2019	132	195	140	116	179	156	259
Average	140	199	150	121	179	159	231
Growth between 2015 and 2019	-7%	-6%	-12%	-3%	6%	-2%	39%

* All ARR and RevPAR are calculated on a per-day basis.

Across the seven cities, hotels in Hong Kong, Singapore, and Tokyo saw the highest ARR on an aggregate level. However, there has been a slight fluctuation in hotel pricing across the three cities. Factors including purchasing parity power and the costs of living impact ARR in each city.

In Singapore, ARR has been relatively stable in the past five years, except in 2017 and 2018, when ARR dropped below USD200. In 2017, service apartments and industry disruptors such as Airbnb offered travelers a plethora of choices. The easing of hotel regulations has also contributed to growth in the number of rooms available. According to industry estimates, the total number of rooms increased from 20,000 to 70,000 between 2012 and 2020. With the influx of new hotels, many existing hotels have diluted their room tariff to compete for the market share, leading to a fall in ARR. The opening of new hotels, coupled with the tightening of foreign labor policy due to the Dependency Ratio Ceiling, has led to a shortage of manpower.

Among other cities, hotels in Hong Kong, Seoul, and Tokyo have a relatively high ARR due to the higher cost of living, a strong currency exchange, and a better standard of living than in other cities. In 2015 and 2019, Hong Kong experienced low levels of ARR due to political unrest, which affected the tourism industry. Tokyo, on the other hand, experiences fluctuating ARR as prices are pegged to demand and supply.

In Bangkok, ARR grew at a steady pace between 2015 to 2018, followed by a slight dip of 11% in 2019. This was due to the political unrest, which led to dwindling tourist demand triggering a price war between hotels to attract customers.

Comparison of Average Room Rate by City and Tier

TABLE 157

AVERAGE ROOM RATE ACROSS FIVE YEARS BY TIER (IN USD).

	Bangkok	Singapore	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Luxury	262	279	216	217	414	290	394
Upscale	185	263	172	193	186	209	283
Mid-tier	84	143	131	96	115	113	127
Budget	38	94	55	19	52	59	91

Across all segments and in each city, ARR is highest among luxury and upscale hotels. The higher prices for rooms at luxury and upscale hotels afford guests additional services that boost customer experience and satisfaction. In contrast, budget hotel rooms are priced the lowest among all hotels.

In Singapore, ARR is the highest in luxury and upscale hotel segments, followed by mid-tier and budget hotels. A slight difference is seen between the price points of luxury and upscale hotels as both tiers prioritize quality service and prestige. Many of the target guest groups are business travelers or customers with higher purchasing power. Hence, with a higher price positioning, many of these hotels provide personalized services and care to their target market. At the other end of the pricing spectrum, a low ARR among budget hotels means that many of the target guest groups within this segment receive basic hotel services and amenities in exchange for cost savings during their stay.

Among the developed cities, luxury hotels in Hong Kong (The Langham and The Peninsula) and Tokyo (The Okura) incorporate historic heritage architecture in their hotel infrastructure, giving luxury hotels the added advantage of premium price positioning. Hence, luxury hotels in Hong Kong and Tokyo have a higher ARR across all seven cities. In terms of developing cities, hotels in Bangkok and Taipei have higher ARR while Kuala Lumpur sees a lower ARR across all tiers due to lower occupancy arising from market saturation. The low ARR in Kuala Lumpur impacts hotel pricing strategies across the industry. In addition, a rising inflation rate and weakening currency have impacted overall economic growth.

Pricing strategy is distinct in Hong Kong and Tokyo as seen in the huge variance across the hotel tiers due to clear price positioning.

Comparison of Profitability Indicator: RevPAR across Cities over Five Years

TABLE 158

OVERALL RevPAR (IN USD).

	Bangkok	Singapore	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	125	150	129	87	129	101	124
2016	107	149	128	90	131	110	141
2017	133	141	123	90	136	110	138
2018	122	146	114	98	165	107	164
2019	101	149	115	87	149	111	138
Average	118	147	122	90	142	108	141
Growth between 2015 and 2019	-19%	-1%	-11%	0%	16%	10%	12%

RevPAR is a profitability ratio used to measure the room's revenue generated from available rooms. The RevPAR trend is relatively aligned with the ARR trend across all cities. Hotels in Singapore continue to depict high profitability with a price difference of 20% from Bangkok and 18% from Taipei. Bangkok shows a slight decrease in RevPAR from 2017 to 2019 due to political unrest that impacted tourist confidence.

Comparison of RevPAR by City and Tier

TABLE 159

RevPAR BY TIER (AVERAGE FROM 2015 TO 2019, IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Luxury	211	255	180	158	329	166	197
Upscale	177	116	160	178	96	163	204
Mid-tier	124	74	89	56	139	72	73
Upscale	66	29	48	13	38	45	78

ARR and RevPAR display the correlation across different hotel tiers. All cities depict a higher ARR and RevPAR on an aggregate level and across all tiers. While the cost of living could affect price points, both ARR and RevPAR are reasonably high in Singapore due to the high demand among tourists and high utilization rates across hotels.

Comparison of Utilization Indicator: Average Occupancy Rate across Cities over Five Years

TABLE 160

OVERALL AVERAGE OCCUPANCY RATE.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	85%	82%	71%	71%	81%	84%	83%
2016	86%	81%	72%	72%	85%	85%	82%
2017	84%	80%	71%	72%	86%	87%	83%
2018	87%	83%	71%	66%	86%	83%	84%
2019	87%	80%	71%	65%	79%	89%	85%
Average	86%	81%	71%	69%	83%	86%	84%
Growth between 2015 and 2019	2%	-2%	0%	-8%	-2%	6%	2%

TABLE 161

AOR BY TIER (AVERAGE FROM 2015 TO 2019).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Luxury	84%	85%	81%	78%	83%	78%	81%
Upscale	89%	79%	73%	80%	88%	99%	90%
Mid-tier	84%	84%	61%	64%	78%	71%	63%
Upscale	79%	79%	72%	59%	90%	65%	96%

Table 160 about Overall Average Occupancy Rate and Table 161 on the AOR by tier (Average from 2015 to 2019) depict high occupancy rates in Bangkok and Singapore, with a high average of 80% and above. Across the board, AOR levels are relatively high among luxury, upscale, and mid-tier hotels, except in Kuala Lumpur and Taipei. The two cities have a consistently low AOR due to the influx of new hotels as well as soft tourism demand during the period of this study. In addition, Taipei's hotel industry is diluted by varying types of accommodations beyond hotels, including hostels, resorts, farms, guesthouses, and homestay lodging, which gives a diverse set of hospitality options to tourists.

Comparison of Efficiency Indicator: Revenue per Worker across Cities over Five Years

TABLE 162

OVERALL ANNUAL REVENUE PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	127,236	65,126	74,027	44,287	87,119	111,061	89,595
2016	128,963	64,640	73,126	45,593	87,412	106,414	94,468
2017	126,869	76,787	75,034	46,467	88,265	99,675	90,674
2018	145,839	81,480	82,080	48,416	84,057	99,987	90,240
2019	170,607	80,930	81,537	59,903	107,687	130,722	111,507
Average	139,903	73,793	77,161	48,933	90,908	109,572	95,297
Growth between 2015 and 2019	34%	24%	10%	35%	24%	18%	24%

Revenue per worker is used as a measurement to ascertain the efficiency of the hotel's workforce with respect to revenue. The performance indicator is directly affected by two areas: revenue and the number of employees. Table 162 illustrates that of the seven cities, hotels in Singapore have the highest revenue per worker. This could be due to higher ARR, AOR, and cost management, which drive higher profit margins in Singapore. Developed cities see higher revenue per worker because of their higher ARR and strong currency. High ARR and AOR also play a crucial part in ensuring profitability within the hotel industry. In contrast, developing cities like Bangkok, Kuala Lumpur, and Taipei witness lower levels of revenue per worker due to lower occupancy rates and ARR.

Comparison of Revenue per Worker by Cities

Across the seven cities, revenue per worker in the luxury tier remains at a relatively high level, except in Kuala Lumpur due to its low ARR and AOR. In Singapore, revenue per worker is higher across all tiers of hotels as compared to the other cities due to higher ARR and occupancy rates. Hong Kong, Seoul, and Tokyo maintained relatively healthy revenue per worker across all tiers.

Comparison of Efficiency Indicator: Revenue per Worker across Cities and Tiers over Five Years

TABLE 163

ANNUAL REVENUE PER WORKER BY TIER (AVERAGE FROM 2015 TO 2019, IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Luxury	127,938	122,675	81,779	37,708	106,334	113,585	145,501
Upscale	143,650	43,698	94,608	65,201	73,024	169,644	105,850
Mid-tier	148,112	57,768	67,638	59,771	101,828	55,651	88,794
Budget	73,388	33,541	57,286	30,035	56,655	73,744	24,791

Hotels in Tokyo lead the table with USD145,501 annual revenue per worker in the luxury tier between 2015 to 2019. In the upscale segment, hotels in Seoul report better performance with USD169,644 annual revenue per worker, while Singapore leads the mid-tier segment with USD148,112. In terms of budget hotels, the study indicates a high performance from hotels in Seoul and Singapore due to high utilization rate of outsourcing vendors and higher occupancy rates respectively.

Comparison of Labor Productivity Indicator: Value Add per Worker across Cities over Five Years

Value added per worker is a measurement of labor productivity. For this study, productivity is defined as the relationship between the inputs and outputs of a system. For instance, productivity can refer to the streamlining of processes. It can include the delegation of work to the best-fit employee (expertise) within the organization to enhance overall work processes, such as the number of employees required per job, number of hours needed to complete a job, accuracy of performance, and quality of output.

TABLE 164

OVERALL ANNUAL VALUE ADD PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	86,383	31,908	47,300	29,691	68,988	91,646	65,053
2016	87,357	34,061	47,555	32,296	70,304	87,340	65,207
2017	88,843	38,583	49,314	30,624	72,295	83,197	62,010
2018	101,230	42,199	55,860	31,899	68,706	82,753	61,696
2019	114,555	38,111	55,370	37,792	86,961	103,824	73,775
Average	95,674	36,972	51,080	32,461	73,451	89,752	65,548
Growth between 2015 and 2019	33%	19%	17%	27%	26%	13%	13%

Value Add per Worker Analysis

Singapore

Labor productivity is significantly higher in Singapore than in the other six cities, largely due to fewer employees and the higher costs of investment. Across all seven cities, hotels in Singapore have the highest value-add per worker [refer to Table 8, Overall Profitability Indicators (% change)]. The high level of value add per worker indicates increasing labor productivity. Hotels in other developed cities like Hong Kong, Seoul, and Tokyo report a high level of value add per worker due to their high revenue flow. Kuala Lumpur continues to perform poorly in value add per worker due to its weak currency and low ARR and AOR.

Further, developed cities tend to have well-built technology infrastructure. Internet connectivity in developed cities attracts more sophisticated and tech-savvy consumer groups. These consumer groups are more receptive to new technological inputs as compared to the consumer groups in developing cities. Hence, hotels will have to adapt to the changing preferences of their target audience to remain relevant and accommodate society's shifting needs. With more technological advancement and adoption, hotels in these cities can operate more efficiently.

Labor Productivity (output per worker)[4] , indicates that Singapore leads across all seven cities with labor productivity of USD151,522 in 2019. The table also shows that most developed cities have a

[4] Since the countries consider productivity at a national level, labor productivity takes into account other sectors such as manufacturing, construction, etc.

high level of labor productivity. While the following indicator analyzes a country's economic environment as a whole, the following dataset corresponds to Frost & Sullivan's finding, with developed cities at the forefront of hotel productivity.

TABLE 165

LABOR PRODUCTIVITY (OUTPUT PER WORKER IN USD) [12].

Country	2019
Singapore	151,522
Hong Kong	118,705
Taiwan*	91,600
South Korea	81,060
Japan	77,490
Thailand	31,204

Source: International Labour Organization. Statistics on Labour Productivity. https://ilostat.ilo.org/topics/labour-productivity/, accessed on 11 May 2021.
* Taipei is not too far behind Singapore as compared to Bangkok. It has higher productivity as they are recognized in other sectors such as manufacturing for precision materials, electronics, and semiconductors, etc. Productivity in other industries may increase the overall productivity level. However, this is not the case for hotels as they are labor-intensive.

Apart from economic and technological advancements that drive labor productivity growth, the Government of Singapore has taken a proactive approach to increase the productivity levels of the labor pool in the hospitality sector. The following points offer details.

- The speed of productivity is dependent on the macro environment, the technological infrastructure of the city, and the availability of resources. Countries such as Singapore are a testbed for new technology adoption because of the government's grant support and the availability of resources. With the government's push for the adoption of technology tools, hotels are more likely to invest in them to increase their operational efficiency.

- The Singapore government takes a proactive approach to ensure that adequate subsidies and grants are given to businesses so they can digitize their processes. For example, the Productivity and Innovation Credit (PIC) Scheme is provided to hotels if they invest in or upgrade their operations. Singapore is a sandbox in which hotels can take risks, as the government acts as a safety net for them to carry out and bring forward innovation and productivity measures.

- Workforce Skills Qualification and SkillsFuture Singapore are other initiatives that the nation has adopted to inculcate a progressive learning culture to upskill its labor force. Also, STB proactively works with hotels to understand their core concerns and provide solutions and brainstorming sessions to solve ongoing productivity issues. Hence, labor productivity is relatively high in Singapore on a national level.

Bangkok

The city has strong governmental support to boost tourism. However, Thailand lacks initiatives that can push productivity forward as the country is still undergoing industrial and social transformation. Bangkok still focuses on increasing its employability rate and equipping the labor market with the skill sets needed to improve people's economic standing. Unlike developed countries like Singapore, where technology and digital infrastructure are well-built, Thailand has just moved into Thailand 3.0 which primarily focuses on manufacturing in heavy industries.

The macro-environment of Thailand aligns with its labor productivity trends, as seen in Table 164, Overall Annual Value Add per Worker (in USD). While labor productivity in Bangkok stood at USD31,908 in 2015, it gradually increased to USD38,111 in 2019.

Unlike Singapore, the city has a spectrum of labor pools with diverse skill sets and different educational levels. This diversity gives Bangkok adequate manpower to perform tasks at different technical levels. Often, people from rural areas make up the majority of manpower in the front office, housekeeping, and food and beverage departments. Technology adoption in Bangkok is slow due to the high availability of manpower.

Taipei

Productivity levels move at a slower pace in Taipei due to low labor wages and manpower availability. However, across the seven cities, hotels in Taipei rank third in terms of labor productivity, with an average of USD51,080. The labor productivity trend corresponds with the productivity per hour worked indicator. While Hong Kong, Seoul, Singapore, and Tokyo are high-income nations, Singapore's availability of foreign labor has helped the city eliminate manpower-related challenges. Meanwhile, Hong Kong, Seoul, and Tokyo lack talent mobility and diversity due to high levels of education. In addition, the lack of a broad available foreign labor pool in these nations has led to higher operating costs. The labor shortage is a rising concern in Hong Kong due to its aging population and declining birth rate [13].

Hong Kong

Hotels in Hong Kong are more receptive to the idea of using technology to replicate tasks as it helps to reduce the need for extra manpower deployment to complete a task. Taking cultural context into account, Hong Kong is one of the most fast-paced cities in Asia where speed and accuracy are crucial to society as a whole. As such, hotels in Hong Kong have a different set of indicators to measure success as efficiency has been deeply rooted across the nation. Furthermore, the lack of foreign labor and labor shortages have an implicit impact on Hong Kong's labor productivity. Hotels in Hong Kong across all tiers, especially mid-tier and budget hotels, have already implemented basic technology tools to aid processes and operations. For example, the incorporation of iPads in front office check-in processes is prevalent across mid-tier and budget hotels to speed up operations.

In Hong Kong, productivity is driven by three factors: technology adoption, digitalization, and streamlining of operations. Hotels in Hong Kong leverage these to improve their overall productivity and position employees to generate higher efficiency rates and value.

1. **Technology adoption** is deeply ingrained across hotel tiers through the use of iPads to support the guest check-in process during peak hours. Housekeeping uses technology to track the progress of the cleaning crew and employs robots to support public area cleaning and housekeeping functions.

2. **Digitalization** is seen across hotel management systems to support back-end operations. It's deployed in collaboration with online traveling agencies and mobile applications like Eatigo to attract more customers.

3. **Streamlining of operations** supports the evaluation of productivity gaps across hotel operations and enables collaboration across departments to enhance the hotel's overall process flow.

Both Tokyo and Seoul face an aging population and lack of available foreign talent, which has led to labor productivity efficiency challenges for hotels in the two cities. In addition, the high cost of labor for local talent is a key problem for many hoteliers. Hence, adoption rates for outsourced vendors are relatively high. As compared to Tokyo, Seoul has a larger appetite for digitization and automation due to its higher rate of technology literacy. Streamlining back-end operations through the use of cloud and other technologies is prevalent among luxury, upscale, and mid-tier hotels.

Seoul

The following explanation illustrates Seoul's approach to labor productivity. Hotels in the city have devised various ways to mitigate the negative effect of climbing manpower costs on profitability. Upskilling and cross-deployment have been critical for ensuring operational preparedness to address dynamically-changing needs and business gaps. The majority of hotels surveyed emphasize the effects of increasing expenditures from manpower costs. These were of particular concern amongst luxury hotels, where emphasis on customer satisfaction and guest interaction has translated into high employee-to-guest ratios.

Tokyo

Productivity in Tokyo is perceived to be lower than in other developed cities due to cultural and societal resistance to changes and new modes of working. Despite being a well-developed city, the productivity of hotels in Tokyo is significantly low as compared to other cities in this study. This is due to high resistance to new technology, the lack of flexibility to streamline operations, and the poor deployment of manpower. The following points elaborate on the productivity challenges faced by the hotels in the city.

1. **Lack of system integration:** As systems are not unified across operations at the individual hotel level, each department uses a different set of systems and there is no integration across functions or roles, leading to lower productivity. The lack of process automation also puts the credibility of hotels at risk. Since data entry is a common practice for administrative and accounting functions, there is a potential threat of human error and falsification of data to inflate numbers.

2. **Idle manpower and resource wastage:** Unlike businesses in other countries, Japanese companies are bound by societal and legal constraints, making it difficult for them to fire underperforming employees. This results in losing out on optimal efficiency gains because manpower expenses might not generate adequate value for companies as all employees are not equally productive. Expats in managerial roles expressed frustration about idle time and resource wastage that further hampers productivity.

3. **Lack of qualified employees:** Hotel managers within the luxury segment report the lack of a qualified talent pool which results in a less skilful industry workforce. Although on-the-job training is provided, hotel managers indicate that there are no institutes to provide hospitality degrees and skill sets to students who are keen on joining this industry. The calibre of talent within Tokyo is vastly different from that of the United States where there are prestigious hospitality schools such as Cornell University's School of Hotel Administration. Across the board, hotel managers with overseas job experience are highly sought after for their competency. Evidently, many high-performing managers hold overseas experience. As such, the lack of competent hoteliers may mean more investments and resources are needed for on-the-job training to equip new employees with the right skill sets.

In a nutshell, while labor productivity is a general challenge for hotel managers, the key inhibitor of productivity growth resides in culturally influenced receptiveness to improving production processes that will reduce idle time and boost efficiencies. Many hotel managers with overseas experiences, especially in the luxury and upscale markets, have expressed their concerns about a fixed mindset towards productivity growth and process improvements.

Comparison of Value Add per Worker across Cities and Tiers

Value add per worker varies by tier and different trends are observed across the seven cities. The following indicator is closely linked to revenue per worker with similar trends across the cities. Tokyo sees the highest performing market in the luxury segment due to higher ARR as compared to the other six cities, while Seoul tops the seven cities with a high value add per worker in the upscale market. Mid-tier hotels offer the highest value add per worker in Singapore. It is noted that Singapore has a higher level of value add per worker in the upscale segment due to increased profitability and streamlined operational processes.

TABLE 166

ANNUAL VALUE ADD PER WORKER BY TIER (AVERAGE FROM 2015 TO 2019, IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Luxury	97,072	50,099	55,467	26,214	87,346	97,071	112,500
Upscale	110,942	19,327	53,193	38,872	69,678	143,435	66,203
Mid-tier	116,330	39,837	50,688	36,161	73,237	35,084	60,009
Budget	46,017	21,786	25,104	34,657	43,421	26,712	15,194

Frost & Sullivan observes similar priorities across the four hotel tiers. Adopting new technologies is prevalent in upscale and mid-tier hotels with high customer volumes due to economies of scale and business sustainability; it is more feasible to incorporate new technologies in hotels where guest volume is high as a way to optimize productivity and manpower deployment. The need to standardize hotel operations also drives productivity initiatives across regions. Additionally, Singapore's data shows that upscale and mid-tier hotels with a large-scale presence like Hilton and Holiday Inn hotels have the right talent pool and experience to drive and maximize productivity. These findings align with the costs of investment experienced by each tier (see Table 85, Cost of Investment in Technology by Tier).

As reported, productivity is highly valued in Singapore, especially by upscale and mid-tier hotels where the priority is to ensure that customers receive quality service from an optimally productive staff. Bearing this in mind, efficiency and time spent on jobs done have been listed, particularly in the mid-tier sector, as the most important metric in achieving a hotel's productivity objective. Similarly, upscale hotels adopt the same approach to productivity. However, they place more emphasis on service quality in exchange for charging a premium price. Productivity ideally results in efficient task completion so that more time can be allocated to serving and interacting with customers.

In Bangkok, luxury hotels have the highest value add per worker as compared to the other segments due to higher ARR (see Table 157, Average Room Rate across Five Years by Tier) and revenue flow (see Table 163, Annual Revenue per Worker by Tier). Upscale hotels have lower value-add per worker as compared to the other tiers because of their greater volumes of deployed manpower (see Table 167, Number of Employees in Bangkok by Tier). Looking at the number of hotel employees

(annually), significantly higher numbers are observed within the luxury (398 employees) and upscale (447 employees) segments as compared to the remaining two tiers, indicating their higher staff-per-guest ratio. Mid-tier and budget hotels have the fewest in-house employees at 186 and 140, respectively.

TABLE 167

NUMBER OF EMPLOYEES IN BANGKOK BY TIER.

	2015	2016	2017	2018	2019	Average
Luxury	431	433	391	396	340	398
Upscale	467	482	477	476	334	447
Mid-tier	185	185	186	188	185	186
Budget	156	152	143	136	111	140

In Taipei, the value add per worker figures are similar, standing at a range of USD50,688 to USD55,467 across luxury, upscale, and mid-tier hotels. Budget hotels have lower value add per worker numbers, as many hotel managers report their low level of technology adoption.

Hong Kong, Seoul, and Tokyo exhibit the highest value-add per worker in the luxury and upscale markets, ranging from USD60,000 to USD100,000. The current data set aligns with overall findings, which indicate a high level of technology adoption. Productivity and output per employee are higher due to the need to upskill and use new technological tools. Mid-tier and budget hotels demonstrate lower value-add per worker due to lower ARR, which affects their overall profitability margins and technology adoption rates.

Comparison of Efficiency Indicator: Gross Operating Profit per Worker across Cities over Five Years

TABLE 168

OVERALL ANNUAL GROSS OPERATING PROFIT PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	54,682.94	32,865.11	26,842.04	28,735.08	75,197.46	69,296.77	55,101.81
2016	55,558.24	33,869.76	24,872.34	31,806.29	67,309.63	66,898.81	55,962.52
2017	57,888.00	37,463.53	26,069.32	30,460.98	68,654.97	65,001.38	56,292.55
2018	57,888.00	41,175.41	32,018.20	32,770.43	65,644.52	69,322.39	53,074.65
2019	66,816.45	38,826.68	32,084.09	39,371.92	90,315.96	84,729.24	66,175.37
Average	82,995.02	36,840.10	28,176.37	32,358.72	72,668.93	70,494.18	57,073.28
Growth between 2015 and 2019	22%	18%	20%	37%	20%	22%	20%

Developed cities like Hong Kong, Seoul, Singapore, and Tokyo see the highest gross operating profit per worker, with a growth of at least 20% in the past five years. Across the three profitability indicators of revenue per worker, value add per worker, and gross operating profit per worker,

hotels in Singapore report healthy levels. Overall, Bangkok, Kuala Lumpur, and Taipei have lower levels of gross operating profit per worker due to weaker currencies, soft tourism demand, and lower ARR as compared to the developed cities.

Profitability Indicator: Gross Operating Profit per Worker across Cities and Tiers

TABLE 169

GROSS OPERATING PROFIT PER WORKER BY TIER (AVERAGE OVER FIVE YEARS, IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Luxury	69,737.30	60,572.87	31,144.89	26,626.01	70,824.39	80,598.66	114,706.52
Upscale	98,147.73	17,310.26	37,229.74	31,301.51	68,552.87	131,282.68	48,479.83
Mid-tier	72,215.53	36,215.11	19,555.35	33,890.09	84,934.27	26,248.91	52,970.48
Budget	54,933.01	21,098.70	25,104.19	34,657.16	43,420.59	26,712.28	15,194.47

Gross Operating Profit per Worker across Cities

The gross operating profit trends in hotels are similar to those of value added per worker. Across the various indicators, the upscale and mid-tier hotels depict the highest productivity in Singapore whereas the luxury and upscale hotels depict the highest productivity in Bangkok, Seoul, and Taipei. Meanwhile, Hong Kong and Tokyo see the highest gross operating cost per worker in the luxury tier due to higher hotel rates than other cities.

In Taipei, profitability is slightly higher for luxury and upscale hotels in comparison to mid-tier and budget hotels due to higher ARR. Furthermore, the higher gross operating profit per worker in Taipei's luxury and upscale hotels could have resulted from standardized operations that streamline processes and reduce costs and/or idle resources. Unlike other cities where mid-tier hotels tend to have higher productivity, a much lower gross operating profit per worker is observed in Taipei, which has a higher proportion of domestic hotels in this segment. While the data is not sufficient to make a conclusive assessment, it suggests domestic hotels may be less productive than international brands.

In Hong Kong, the luxury, upscale, and mid-tier markets show high gross operating profit per worker as compared to the other developed cities. Budget hotels in Hong Kong also demonstrate high profitability, only behind Singapore. The high profitability results from lower operating costs and higher toplines.

Seoul sees higher gross operating profit per worker in its luxury and upscale hotels due to a higher rate of technology penetration as compared to the other tiers. In addition, the adoption of technologies to support back-end operations have helped drive higher operational efficiency while hotels maintain overall profitability through less manpower deployment.

Hotels in Tokyo registered the highest gross operating profit per worker in its luxury tier due to their price premium strategies while the other tiers experience a lower level of profit due to higher operating costs caused by large operational sizes, in terms of the number of rooms and customer volumes.

Gross Operating Profit across Tiers

Across all seven cities, luxury and upscale hotels perform better than the other tiers in terms of profitability due to higher ARR and revenue flow. The data for upscale hotels in Bangkok may be

an outlier due to the higher proportion of employees from participating hotels. The data indicates a collective focus on pursuing excellent service rather than higher profits. Moreover, the upscale and mid-tier hotels have a higher gross operating profit per worker as compared to luxury hotels, indicating higher productivity.

In Singapore, gross operating cost per worker is highest in the upscale and mid-tier segments. This is due to the higher deployment of technology in these tiers as compared to luxury and budget hotels. These upscale and mid-tier hotels have deployed technology systems to predict, track, review, and analyze guest services to ease operational processes and keep expenses marginally low.

Budget hotels have a lower gross operating profit per worker when compared to the other tiers. Their small scale and more cautious approach to technology adoption could have helped budget hotels maintain their gross operating profits at that level. Overall, these hotels believe that their current workforce is adequate and do not see the benefits of adopting technology. Furthermore, adding new technology might not improve productivity as the costs incurred and additional learning required to deploy it might not be helpful in reducing the workload.

In general, hotels operating under the franchisee model tend to have the first-mover advantage. However, managers of luxury hotels expressed their reservations about integrating innovation into hotel operations because customer satisfaction and service quality are their key performance indicators. Nevertheless, luxury hotels are most likely to integrate technology in back-end operations to enhance overall business processes. The hotels in this tier usually take a slower-paced approach to ensure customers are offered a full-service package. Across the board, three approaches are adopted to increase productivity: digitalization, technology adoption, and streamlining of operational processes.

Efficiency Indicator: Operating Cost per Worker across Cities over Five Years

TABLE 170

OVERALL ANNUAL OPERATING COST PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40,854	33,218	26,727	14,596	18,131	19,415	24,542
2016	41,607	30,579	25,570	13,297	17,108	19,074	29,261
2017	38,026	38,204	25,720	15,843	15,970	16,478	28,665
2018	44,609	39,281	26,220	16,517	15,351	17,234	28,545
2019	56,051	42,819	26,167	22,111	20,726	26,898	37,731
Average	44,229	36,820	26,081	16,473	17,457	19,820	29,749
Growth between 2015 and 2019	37%	29%	-2%	51%	14%	39%	54%

Efficiency Indicator: Operating Cost per Worker across Cities and Tiers

TABLE 171

OVERALL ANNUAL OPERATING COST PER WORKER BY TIER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Luxury	39,688	74,904	27,371	11,494	18,988	16,514	33,001
Upscale	38,990	25,015	43,500	26,329	3,346	26,210	39,647
Mid-tier	46,084	19,396	20,272	23,611	28,591	20,567	28,784
Budget	30,425	7,227	25,696	2,846	12,650	45,825	6,496

Operating cost per worker measures the efficiency of a hotel based on how much operating expense is being utilized by an employee. Across all cities, Singapore and Tokyo have the highest operating costs per worker on an aggregate level, which might be the result of higher expenses and cost of living in these two cities. However, inconsistency is observed in the trend across all cities and tiers, except in the mid-tier hotels where a low level of operating cost per worker is maintained across all seven cities. Meanwhile, Singapore's mid-tier hotels maintain a relatively high operating cost per worker as compared to the other tiers. While a higher operating cost per worker might indicate lower productivity, this is not necessarily the case in Singapore as the number of employees in the mid-tier hotel across the city is significantly lower than in other tiers. Higher operating costs per worker might also be affected by investment costs, outsourcing expenses, and other material costs needed to operate a hotel.

In all cities, luxury and upscale hotels have the highest operating cost per worker. This indicates that despite deploying more employees during operations (as hotel managers in this segment placed high emphasis on service quality and guest experience), the costs of serving guests are also higher. It is important to note that Hong Kong has a significantly lower operating cost. This is due to a lack of data points (n-2) as respondents from the city did not provide information on operating costs due to their sensitive nature.

Across the board, budget hotels tend to have a slightly lower operating cost per worker as they are often smaller in size in terms of operation. For budget hotels in Bangkok, operating cost per worker is significantly lower than in Singapore and Taipei due to lower revenue flow (and thereby costs) in this segment. Overall, the operating cost per worker trends may appear more inconsistent for some cities due to the cost of living and the hotels' operational size and manpower count.

Perception of Productivity

The following trends emerged in terms of the perception of productivity.

Productivity is the Integration of Technology and Human Interaction

- Across the board, human interaction is still considered crucial to the hospitality industry where service quality and customer satisfaction are tied to the overall success of a hotel.

- Hotels prioritize customer retention and brand reputation. Technology and robotics are not expected to be at the forefront but they play an important role to integrate seamless transition in business operations.

- Incorporating technologies like property management systems helps reduce the time needed on miscellaneous issues allowing employees and hotel staff to focus on customer engagement and service quality.

Productivity Supports Guest Satisfaction

- Productivity involves the effective deployment of manpower across the hotel's departments without compromising the quality of service and level of accuracy.
- Technology acts as a complementary tool to enhance overall business operations and ensure all departments operate together seamlessly.
- Reduces risk of potential human error:
    - Technology tools such as chatbots and other communication platforms help to effectively communicate guests' needs to the hotel team.
    - This leads to avoidance of the potential for error. Instead of having to manually call the receptionist, guests can key in their request. The hotel system receives it and sends it to the back office.
    - Hotels are driving digitalization by going paperless and using QR codes and apps to reduce human contact in light of the COVID-19 pandemic.
- Improves guests' perception of the hotels brand:
    - Guest's sentiment plays a crucial role in driving management's decision to deploy new technology.
    - Adoption of technology is still essential to maintaining and preserving a hotel's overall image.
    - The lack of technology adoption might portray the hotel as outdated or unable to keep up with trends.

Impact of COVID-19

The pandemic adversely affected the hotel industry across all seven cities reviewed under this study because COVID-19 led to the absence of foreign tourists. The loss of tourism revenue restrained business revenue and employment opportunities. To cope with the ongoing challenges, hotels across the cities are looking to reduce operating costs to ensure business continuity. Some of the approaches taken to reduce operating costs include:

- With the industry facing manpower crunch due to COVID-19, hotels are pushing for cross-deploying employees across roles and functions to improve productivity.
- More hotels are upskilling their employees across all tiers to support the sudden shortage of manpower. Hotels are actively cross-breeding job roles by encouraging employees to take up new roles or learn new skills to reduce the number of workers deployed per shift.

For example, restaurant staff with idle time are now encouraged to support front office staff by serving or helping with customer check-ins.

Driven by the pandemic, these three factors are forcing the hotels across the seven cities to adopt new approaches.

- COVID-19 has helped expedite productivity processes as employees have reduced their resistance to taking on new roles or upgrading their positions to sustain employment during this period.

- Hotels, especially in Singapore, are facing manpower shortage due to their heavy reliance on foreign workers, many of whom are stuck in their home countries.

- Across the board, job roles are merging, expectations are changing, and the potential for new roles is emerging through cross-deployment initiatives.

Conclusion

As the hotel industry prioritizes human interaction and hospitality, service quality and customer satisfaction form the foundation of the hotel business model. Overall, technology adoption by hotels in Bangkok, Hong Kong, Seoul, Singapore, Taipei, and Tokyo has increased during the five years from 2015 to 2019. However, hotel managers interviewed during the study also emphasized that the industry is largely driven by manpower and human interaction. The adoption of technology should exist in terms of technological fit and compatibility with the hotel's strategic goals and outcomes, technology literacy levels of employees, and its infrastructure.

This research indicates that productivity across all seven cities varies and is dependent on the economic and technological development of their respective countries. On a macro-environment level, key factors affecting productivity stem from the availability of labor and development, technology penetration rate across the nation, digital literacy rate, and the national plan for digitalization and automation. These factors impact national productivity levels in terms of the overall labor landscape and production output as well as economic drivers. On a micro-environment level, key determinants of productivity levels stem from early adopters of technology, industry leaders, and industry dynamics.

Among the seven cities, hotels in Hong Kong, Seoul, and Tokyo have the highest technology adoption rates while Singapore sees one of the lowest in comparison to the other developed cities. Despite low levels of technology penetration, hotels in Singapore have one of the highest rates in terms of profitability and labor productivity. This improvement corresponds to high compliance with the SOP across the stakeholders in the sector. Among the developing cities, hotels in Bangkok lead the region in technology adoption due to the availability of infrastructure that supports their capacity to adopt and implement new technologies. Despite higher technology adoption in comparison to Singapore, hotels in Kuala Lumpur and Taipei have lower levels of profitability due to lower occupancy rates, which lead to increased idle time. This affects the employee productivity output.

Across all cities, upscale and mid-tier hotels have higher levels of productivity due to high customer volumes, which allow hotels to leverage economies of scale. Luxury hotels see a moderate level of

productivity with a higher level of profitability due to a 1:1 manning ratio. However, in light of the COVID-19 pandemic, hotels across the board are shifting to cross-functional deployment models to maximize labor productivity and reduce operational and manpower costs. In terms of average profitability during the five years from 2015 to 2019, Tokyo has the highest level of performance in the luxury segment, Seoul has the highest profitability in the upscale market followed by Singapore in the mid-tier market.

In terms of technology adoption, hotels in Hong Kong, Seoul, and Tokyo have high technology adoption rates due to high labor costs. Conversely, Singapore has high profitability and labor productivity because the industry in the city is manpower-driven and hotels have high occupancy rates. Taking these factors into account, it can be inferred that the speed of productivity depends on labor landscape and market conditions.

While there are several factors driving productivity in the sector, COVID-19 has accelerated productivity across all hotel functions. Hotels, especially in Bangkok, Kuala Lumpur, and Taipei where manpower is abundant in normal times, now have to devise new plans to sustain business operations while dealing with the shortage of manpower. In response to the lack of business revenue, the key performance indicators (KPIs) have shifted from financial KPIs to productivity KPIs to ensure operating costs are kept within control. Hong Kong, Seoul, and Tokyo have transitioned to using fewer employees and encouraging unpaid leave while using outsource vendors to reduce costs.

Across the board, hotels from all tiers are taking different approaches to improving productivity. In the pre-COVID era, cross-functioning was largely adopted by mid-tier and budget hotels to maintain profit margins. Luxury hotels tend to deploy a 1:1 manning ratio to ensure the service team is large enough to achieve quality customer care and satisfaction. However, in the current climate, many luxury hotels are looking at ways to reduce the number of employees per shift and still provide the same standard of service quality.

Key Takeaways

The key takeaways in this study redefine the essence of productivity through varied factors.

1. Productivity improvement is a combination of labor productivity, profitability, and technology adoption rate. The utilization of resources such as manpower deployment and cost maximization, identification of productivity gaps, and customer sentiments are crucial to the implementation of productivity strategy. The over-adoption of technology may underserve its intended purpose.

2. Key functions such as front office, housekeeping, and F&B are still driven by manpower due to precision of execution and ability to make decisions. In addition, being a service-oriented industry, the human touch is crucial in this business.

3. Every hotel has a different standard operating procedure and may have varying operational processes in various departments. The evaluation of technology adoption depends on the hotel's operating process, unproductive areas, and suitability. Hotel managers should assess the unproductive areas to understand technological fit of various devices before adopting them to achieve better productivity gains.

4. Technology is more suited for back-end work supporting functions such as marketing and sales, engineering, and other areas to drive profitability.

5. Consumer receptivity and the overall national resource availability also account for the overall process improvement feasibility.

APPENDIX: SURVEY DETAILS

List of Participating Hotels

Frost & Sullivan conducted 146 interviews for the study. Six additional samples were taken to replace bad data.

S/N	City	Name of Hotel	Hotel Tier
1	Bangkok	Mövenpick BDMS Wellness Resort Bangkok	Luxury
2	Bangkok	Siam Kempinski Hotel Bangkok	Luxury
3	Bangkok	Banyan Tree Bangkok	Luxury
4	Bangkok	Intercontinental	Luxury
5	Bangkok	Park Hyatt Hotel	Luxury
6	Bangkok	Dusit Suites Hotel Ratchadamri Bangkok	Upscale
7	Bangkok	DoubleTree by Hilton Bangkok Ploenchit	Upscale
8	Bangkok	Novotel Bangkok Suvarnabhumi Airport Hotel	Upscale
9	Bangkok	W Hotel	Upscale
10	Bangkok	Hotel Nikko Bangkok	Upscale
11	Bangkok	Holiday Inn Bangkok Sukhumvit	Mid-tier
12	Bangkok	Dusit Princess Srinakarin Bangkok	Mid-tier
13	Bangkok	Riverfront Bangkok	Mid-tier
14	Bangkok	Grand Mercure Foretune	Mid-tier
15	Bangkok	Mercure Bangkok Siam	Mid-tier
16	Bangkok	Ibis Styles Bangkok Khaosan Viengtai	Budget
17	Bangkok	Centra by Centara Government Complex Hotel & Convention Centre Chaeng Watthana	Budget
18	Bangkok	Novotel Suites Bangkok Sukhumvit 34	Budget
19	Bangkok	Red Planet Bangkok Surawong	Budget
20	Bangkok	The Tawana Bangkok	Budget
21	Taipei	Swiio Hotel Daan	Luxury
22	Taipei	Sherwood Taipei	Luxury
23	Taipei	Les Suites Ching Cheng	Luxury
24	Taipei	Grand Hyatt Taipei	Luxury
25	Taipei	Le Méridien Taipei	Luxury
26	Taipei	Shangri-La's Far Eastern Plaza Hotel, Taipei	Luxury
27	Taipei	The Tango Taipei XinYi	Upscale

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S/N	City	Name of Hotel	Hotel Tier
28	Taipei	Laurel Evergreen Hotel Taipei	Upscale
29	Taipei	Hilton Taipei Sinban	Upscale
30	Taipei	Yang Ming Shan Tien Lai Resort & Spa	Upscale
31	Taipei	Hotel Proverbs	Upscale
32	Taipei	Aloft Taipei Beitou	Mid-tier
33	Taipei	Capital Hotel Songshan	Mid-tier
34	Taipei	Royal Inn Taipei Nanxi	Mid-tier
35	Taipei	Fullon Hotel Taipei, Central	Mid-tier
36	Taipei	Grand Hotel	Mid-tier
37	Taipei	Hotel Intrendy	Budget
38	Taipei	109 Hostel Taipei	Budget
39	Taipei	Golden Garden Hotel	Budget
40	Taipei	Chairman Hotel	Budget
41	Taipei	LuckyOne Hostel	Budget
42	Singapore	Naumi Hotels Sg Pte Ltd	Luxury
43	Singapore	Kempinski	Luxury
44	Singapore	InterContinental Singapore	Luxury
45	Singapore	Regent Singapore	Luxury
46	Singapore	Four Seasons Hotel	Luxury
47	Singapore	Oakwood	Upscale
48	Singapore	Hilton Singapore	Upscale
49	Singapore	Oasia	Upscale
50	Singapore	Carlton Hotel Singapore	Upscale
51	Singapore	Marina Bay Sands	Upscale
52	Singapore	Holiday Inn Singapore Atrium	Mid-tier
53	Singapore	Copthorne King's Hotel Singapore	Mid-tier
54	Singapore	Lloyd's Inn	Mid-tier
55	Singapore	Parkroyal on Kitchener Road	Mid-tier
56	Singapore	Yotel Singapore	Mid-tier
57	Singapore	Populous Hotel	Budget
58	Singapore	Bliss Hotel Singapore	Budget
59	Singapore	New Orchid Hotel	Budget
60	Singapore	Q Loft Hotels	Budget

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S/N	City	Name of Hotel	Hotel Tier
61	Singapore	Strand Hotel	Budget
62	Kuala Lumpur	Fraser Residence Kuala Lumpur	Luxury
63	Kuala Lumpur	Mandarin Oriental	Luxury
64	Kuala Lumpur	JW Marriott KL	Luxury
65	Kuala Lumpur	Renaissance Hotels	Luxury
66	Kuala Lumpur	Sofitel Damansara	Luxury
67	Kuala Lumpur	Wedgewood Residences	Upscale
68	Kuala Lumpur	Ibis Kuala Lumpur City Centre	Upscale
69	Kuala Lumpur	DoubleTree by Hilton Hotel	Upscale
70	Kuala Lumpur	The Westin	Upscale
71	Kuala Lumpur	Movenpick Hotel and Convention Centre Klia	Upscale
72	Kuala Lumpur	Holiday Inn Express Kuala Lumpur City Centre	Mid-tier
73	Kuala Lumpur	Cosmo Hotel Kuala Lumpur	Mid-tier
74	Kuala Lumpur	Vivatel Kuala Lumpur	Mid-tier
75	Kuala Lumpur	Crystal Crown Hotel PJ	Mid-tier
76	Kuala Lumpur	Cititel Mid Valley	Mid-tier
77	Kuala Lumpur	Impiana KLCC Hotel	Mid-tier
78	Kuala Lumpur	Hotel Istana KL	Mid-tier
79	Kuala Lumpur	Furama Bukit Bintang	Budget
80	Kuala Lumpur	The Loftplazahotel	Budget
81	Kuala Lumpur	Koptown Hotel KL	Budget
82	Kuala Lumpur	Sakura Boutique Hotel	Budget
83	Kuala Lumpur	Hotel 1000 Miles	Budget
84	Hong Kong	Conrad Hong Kong	Luxury
85	Hong Kong	Marriot International	Luxury
86	Hong Kong	The Harbour View Place	Luxury
87	Hong Kong	The Peninsula Hong Kong	Luxury
88	Hong Kong	Four Seasons	Luxury
89	Hong Kong	Regal Airport Hotel	Upscale
90	Hong Kong	Hyatt Centric Victoria Harbour Hong Kong	Upscale
91	Hong Kong	East Hong Kong	Upscale
92	Hong Kong	Cordis Hotel	Upscale
93	Hong Kong	Hotel Madera Hollywood	Upscale

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S/N	City	Name of Hotel	Hotel Tier
94	Hong Kong	New World Millennium HK Hotel	Mid-tier
95	Hong Kong	Nina Hotel Island south	Mid-tier
96	Hong Kong	Novotel Hong Kong Nathan Road Kowloon	Mid-tier
97	Hong Kong	Empire Hotel Kowloon - Tsim Sha Tsui	Mid-tier
98	Hong Kong	Marco Polo Hongkong Hotel	Mid-tier
99	Hong Kong	Welcome Inn	Budget
100	Hong Kong	WKT Hospitality Limited Aka Koalabeds	Budget
101	Hong Kong	Butterfly Wellington Central Hotel	Budget
102	Hong Kong	The Kimberley Hotel	Budget
103	Hong Kong	Rosedale Hotel Hong Kong	Budget
104	Seoul	Four Seasons Hotel Seoul	Luxury
105	Seoul	InterContinental Grand Seoul Parnas	Luxury
106	Seoul	Novotel Ambassador Seoul Dongdaemun Hotels & Residences	Luxury
107	Seoul	Millennium Seoul Hilton	Luxury
108	Seoul	JW Marriot	Luxury
109	Seoul	Royal Hotel Seoul	Upscale
110	Seoul	The Classic 500	Upscale
111	Seoul	Lotte Hotel World	Upscale
112	Seoul	Best Western Premier Hotel Kukdo	Upscale
113	Seoul	Oakwood Premier Coex Center	Upscale
114	Seoul	Crowne Park Hotel Seoul	Mid-tier
115	Seoul	Hotel Rian	Mid-tier
116	Seoul	Metro Hotel	Mid-tier
117	Seoul	Loisir Hotel Seoul Myeongdong	Mid-tier
118	Seoul	Hotel Skypark	Mid-tier
119	Seoul	Jongro Icon Hotel	Budget
120	Seoul	Step in Myeondong 1	Budget
121	Seoul	Come in Guesthouse	Budget
122	Seoul	New Oriental Hotel	Budget
123	Seoul	City Park Hotel	Budget
124	Tokyo	The Okura	Luxury
125	Tokyo	Aman Tokyo	Luxury
126	Tokyo	Okura Tokyo Bay	Luxury

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S/N	City	Name of Hotel	Hotel Tier
127	Tokyo	Four Seasons Hotel Tokyo at Marunouchi	Luxury
128	Tokyo	The Ritz-Carlton, Tokyo	Luxury
129	Tokyo	Imperial Hotel Tokyo	Luxury
130	Tokyo	Conrad Tokyo	Luxury
131	Tokyo	Andaz Tokyo Toranomon Hills	Luxury
132	Tokyo	Hilton Tokyo	Upscale
133	Tokyo	Oakwood Premier Tokyo	Upscale
134	Tokyo	Hyatt Regency Tokyo	Upscale
135	Tokyo	Courtyard by Marriott Tokyo Ginza Hotel	Upscale
136	Tokyo	Keio Plaza Hotel	Upscale
137	Tokyo	Hotel Monterey Ginza	Mid-tier
138	Tokyo	Hilltop Hotel	Mid-tier
139	Tokyo	Shibuya Tobu Hotel	Mid-tier
140	Tokyo	Hotel East 21 Tokyo	Mid-tier
141	Tokyo	Mercure Tokyo Ginza Hotel	Mid-tier
142	Tokyo	Centurion Hotel Grand Akasaka	Budget
143	Tokyo	Stay Shinjuku	Budget
144	Tokyo	Tobu Hotel Levant Tokyo	Budget
145	Tokyo	Hotel Gracery Tamachi	Budget
146	Tokyo	Hotel Villa Fontaine Tokyo-Roppongi	Budget

Discussion Guide

Frost & Sullivan has been commissioned by the APO to conduct a benchmarking study across seven cities to understand the productivity levels of the hotel industry across different hotel tiers. These seven cities include Bangkok, Hong Kong, Kuala Lumpur, Seoul, Singapore, Taipei, and Tokyo. In this study, Frost & Sullivan will be focusing on key operational indicators pertaining to the front office, housekeeping, and other related productivity data.

Your identity and responses will be kept confidential. All information provided during this interview will be analyzed at an aggregated level solely for this study.

Background
City
Name of Hotel
Name of Participant
Designation of Participant
Date of Interview

Section A: Business landscape of hotel industry

1. **Could you share with us your perspective on the growing trends in the hotel industry over the past 5 years? (Areas to deep dive: PEST)**

   A. What are some growth drivers/inhibitors of the hotel industry in APAC region/your city?

   B. How have these trends impacted hotels? (Areas to deep dive across different tiers of luxury, upscale, mid-tier and budget)

      2015

      2016

      2017

      2018

      2019

      2020 (Forecast)

2. **Could you share with us some of the government initiatives to support the hotel industry? What are some of the government initiatives adopted by your hotel?**

   A. How have these initiatives impacted your business (grants, policies, etc.)? (Areas to deep dive: technology/productivity)

Section B: Business model and strategy

3. **Could you share with us your business model?**

   A. Strategic Positioning

   B. Target Customers

   C. Competitive Advantage

   D. Best Practices

Section C: Productivity and technology

4. **In recent years, productivity has been the key area of focus for many industries. Could you share your perception of productivity[5] in the hotel industry?**

   A. How important is productivity to your hotel?

   B. Could you elaborate how productivity has affected your hotel in the following areas: manpower deployment, business operations, innovation and productivity, and others (please specify).

5. **How has your hotel incorporated productivity into its business operations? Could you share some examples in the following hotel functions?**

6. **Which of the following hotel functions has the highest technological investment? Why? (Front Office, House Keeping, F&B, others)**

   Front Office

   House Keeping

   F&B

   Others

7. **What are the key motivators/inhibitors that affect the rate of technology adoption? (Areas to deep dive: people, process, systems/technology, governance, others)**

8. **How has the adoption of such technology impacted your overall productivity in its designated hotel functions? (Areas to deep dive: reduction in man-hours, reduction of human errors, increased customer satisfaction, reduced waiting time, etc)**

Years	Factors		
	Name of Technology	Hotel Functions (Housekeeping, Front Office, F&B, Others)	Objectives of Technology
2015			
2016			
2017			
2018			
2019			
2020 (F)			

[5] Schroeder (1985) defined productivity as the relationship between the inputs and outputs of a productive system. Productivity can refer to streamlining of processes. It can include the delegation of workload according to the right expertise within the organization to enhance the overall work process; the number of manpower required per job; the number of hours needed to complete a job; accuracy of performance; and quality of output.

9. **How does your hotel manage productivity issues? (Probe skill gaps in labor pool, lack of expertise to adopt technology, lack of funding, etc.)**

   A. What are the strategies adopted by the hotel to ensure smooth integration of new technologies? (Areas to deep dive: people, process, systems/technology, governance, others)

   B. What are some of the challenges faced while adopting new technology? (Areas to deep dive: people, process, systems/technology, governance, others)

   C. How does the hotel deal with these challenges?

10. **Does your hotel measure productivity? If yes, what are these measures?**

    Front Office

    House Keeping

    F&B

    Others

11. **Apart from technology adoption, what are some strategies adopted by the hotel to increase productivity?**

    A. Redesign Operations Process

    B. Upskilling Employees

    C. Others (i.e., Research and Consultancy, Rebuilding New Business Model, etc.)

12. **When adopting new technology, what are some of the areas of consideration in terms of return of investment?**

13. **What are some financial metrics used to measure the effectiveness of implementing new technology?**

Section C: Manpower deployment strategies

14. **How has the aforementioned technology affected manpower deployment?**

    Front Office

    House Keeping

    F&B

    Others

15. **Apart from technology adoption, what are some manpower deployment approaches adopted by your hotel?**

16. **Do you outsource any of your hotel functions? Why? How has it impacted the hotel?**

Section D: Customer satisfaction strategies

17. **What are some of the key attributes that contribute to customer satisfaction? Could you elaborate according to the following hotel functions? (Probe on customer satisfaction measure)**

    Front Office

    House Keeping

    F&B

    Others

18. **In your opinion, has the adoption of new technology affected customer satisfaction? Could you share some examples?**

    Front Office

    House Keeping

    F&B

    Others

19. **What are some approaches adopted by your hotel to improve customer satisfaction? Could you elaborate according to the following hotel functions?**

    Front Office

    House Keeping

    F&B

    Others

Section E: Impact of COVID-19 and future strategies

20. How has COVID-19 affected the hotel industry?

21. How has COVID-19 impacted your overall hotel operations?

A. What are the new operational measures taken in preparation for the recovery after COVID-19 in the following functions? Please elaborate.

Manpower Deployment	E.g., Reduction of shift/hours pay cut to employees
Business Operations	E.g., Diversifying demand, updating loyalty programs, change of offerings to consumers.
Innovation & Productivity	E.g., Reduce investment of technology to sustain cash flow
Others	

22. What are some of the countermeasures adopted in view of COVID-19?

23. What do you think will be the new trends in the hotel industry in light of COVID-19?

A. How do you think strategies will change within the hotel industry in your city/ APAC?

24. Do you have any plans to further increase productivity in the following hotel functions? Please elaborate?

Front Office

House Keeping

F&B

Others

Thank you for your participation

Questionnaire

Introduction

Frost & Sullivan has been commissioned by the APO to conduct a benchmarking study across seven cities to understand the productivity levels of the hotel industry across different hotel tiers. These seven cities include Bangkok, Hong Kong, Kuala Lumpur, Seoul, Singapore, Taipei, and Tokyo. In this study, Frost & Sullivan will be focusing on key operational indicators pertaining to the front office, housekeeping, and other related productivity data.

Your identity and responses will be kept confidential. All information provided in this questionnaire will be analyzed at an aggregated level solely for this study.

Information will be filled in by respondents via survey link. Kindly provide your input from Section A to F.

Background
City of Hotel:
Name of Hotel:
Name of Participant:
Department:
Designation of Participant:
Date and Time:

Section A: Manpower deployment across each hotel function from 2015 to 2019

Manpower Count	Year				
	2015	2016	2017	2018	2019
Number of Employees in Hotel Annually (Overall)					
Number of Employees in Front Office (FO)					
Number of Employees in Housekeeping (HK)					
Number of Employees in Food & Beverage (F&B)					
Number of Outsourced Employees by Functions (FO)					
Number of Outsourced Employees by Functions (HK)					
Number of Outsourced Employees by Functions (F&B)					

Section B: Man-hours deployed across each hotel function (by months) from 2015 to 2019

Average Hours	Year				
	2015	2016	2017	2018	2019
Average Number of Hours Worked per Employee (Overall)					
Average Number of Hours Worked per Employee (FO)					
Average Number of Hours Worked per Employee (HK)					
Average Number of Hours Worked per Employee (F&B)					

Kindly provide figures in estimation if data is unavailable.

Section C (i): Hotel occupancy rate from 2015 to 2019

Number of Room	Year				
	2015	2016	2017	2018	2019
Total Number of Rooms in Hotel					
Total Rooms (Nights Available)[6]					
Total Rooms (Nights Occupied Annually)					
Total Room (Nights Sold Complimentary)					
Average Room Rate (Annual Average)					
Revenue per Available Room (Annual Average)					

Kindly provide figures in estimation if data is unavailable.

Section C (ii): Labor productivity (added)

Productivity can refer to streamlining of processes.

- It can include exercising delegation of workload according to the right expertise within the organization to enhance overall work process.
- Number of manpower required per job
- Number of hours needed to complete job
- Accuracy of performance.
- Quality of output.

[6] Number of rooms available for guests (notwithstanding any renovated rooms, rooms for staff used, etc.); [Adapted from STB]; Nights available - maximum rooms - rooms under renovation, for use by staff and others.

Labor Productivity	Year				
	2015	2016	2017	2018	2019
Average time taken to clean a Room (Housekeeping)					

Front Office	Top 5 Job Function				
	Name of Job Function 1	Name of Job Function 2	Name of Job Function 3	Name of Job Function 4	Name of Job Function 5

Average Time Taken to Complete each Function	Year				
	2015	2016	2017	2018	2019

Food & Beverage	Top 5 Job Function				
	Name of Job Function 1	Name of Job Function 2	Name of Job Function 3	Name of Job Function 4	Name of Job Function 5

Average Time Taken to Complete each Function	Year				
	2015	2016	2017	2018	2019

Kindly provide figures in estimation if data is unavailable.

Section D: Revenue/operational cost across different hotel operations from 2015 to 2019

Revenue/ Operation	Year				
	2015	2016	2017	2018	2019
Revenue of Participating Hotel[7]					
Revenue from Guests (Room)					
Revenue from Restaurant / Banquet					
Number of Guest Annually					
Total Number of Covers[8] Annually (Hotel Guests + Non-Guests)					
Operating Cost					
Manpower Costs					
Other Revenue Streams (Not including hotel/guest and F&B revenue)					

Kindly provide figures in estimation or in percentage of revenue in hotel (overall) if data is unavailable.

[7] Participating hotel refers to the hotel where the respondent is working.
[8] Cover refers to a diner who eats or meal that is served (number of diners from F&B).

Section E: Technology adoption across different hotel functions

Technology	
Number of Technology Adopted	Insert Number

	Name of Technology	Function (House Keeping, Front Office, and F&B. Please specify for others)	Year of Adoption	Description of Technology	Man-hour saved from Technology (in minutes)
1.	(Insert Name)				
2.					
3.					
4.					
5.					
6.					

Section F: Productivity

1. **On a 5-point scale, with 5 being very important and 1 being not important at all, how important is productivity to your hotel?**

Not important at all	Slightly important	Fairly important	Important	Very important

2. **On a 5-point scale, with 5 being very impactful and 1 being not impactful at all, how impactful is productivity to overall customer's satisfaction?**

Not impactful at all	Slightly impactful	Fairly impactful	Impactful	Very impactful

3. **On a 5-point scale, with 5 being very impactful and 1 being not impactful at all, how impactful is technology adoption on overall productivity?**

Not impactful at all	Slightly impactful	Fairly impactful	Impactful	Very impactful

4. **On a 5-point scale, with 5 being very helpful and 1 being not helpful at all, how helpful is technology adoption on manpower deployment?**

Not helpful at all	Slightly helpful	Fairly helpful	Helpful	Very helpful

5. **On a 5-point scale, with 5 being very helpful and 1 being not helpful at all, how helpful is technology adoption on the reduction of man-hours?**

Not helpful at all	Slightly helpful	Fairly helpful	Helpful	Very helpful

6. **On a 5-point scale, with 5 being very likely and 1 being not likely at all, how likely will you adopt more technological enhancement tools in your hotel?**

Not likely at all	Slightly likely	Fairly likely	Likely	Very likely

7. **(a) Could you share with us the overall cost of investment (in estimation) on integrating new technologies over the past 5 years (2015 to 2019)? [Open-Ended] (total cost of investment from 2015 to 2019)**

   Answer in USD __

   (b)Based on Question 7, could you share with us the total amount of man-hours saved as a result of these technology adoptions across 2015 to 2019? Please answer in %.

   Answer in __%

8. **Which of the following hotel function has the largest spending on technology? Could you rank them from 1 being the largest spending and 4 being the lowest?**

   Front Office

   Housekeeping

   F&B

   Others,

   Please Specify _____

9. **What are the types of technological enabling tool has been adopted among these hotel function? Please TYPE YES if applicable to the following hotel function.**

	Technology Enabling tools				
Hotel Functions	**Internet of Things**	**Robotics**	**Robotics Process Automation**	**Video Analytics**	**Artificial Intelligence & Machine Learning**
Front Office					
Housekeeping					
F&B					
Others, Please Specify					

10. Please Select the type of technology adopted by your hotel (Multiple Answers)

Hotel Functions	Types of Technology Solution		
Housekeeping	1.	e-Housekeeping	e-Housekeeping enables seamless scheduling of room cleaning, housekeeper assignments, room status updates, mini bar consumption, defects tracking, etc.
	2.	RFID Uniform and Linen Management	Solution leverages RFID to automatically count and track linen and uniform inventory.
	3.	Privacy and Make Up Room Signaling	Privacy and Make Up Room solution uses in-room motion sensors to detect if guest has left the room and alerts housekeeping staff to clean room. Integrated with real-time tracking of in-room Privacy and Make Up Room indicator.
	4.	Power Assisted Delivery	Power assisted delivery system aids staff in moving heavy loads safely and efficiently.
	5.	Housekeeping Delivery Robots	Autonomous front of house robots to aid with delivery of guest requested items to guest rooms; and, Heart-of-House robots to deliver linen and collect waste.
	6.	Public Area Floor Cleaning Robots	Robots to automate floor cleaning tasks.
	7.	Data Analytics for Resource Optimization	Analyzes guest feedback, preferences and resource usage to provide actionable plans to improve productivity and deliver better guest experiences.
	8.	Integrated Smart Room	Solution to enhance room with tech capabilities such as paperless check-in/out, messaging, in-room control capabilities, etc.
	9.	e-Compendium	The e-Compendium replaces traditional printed materials in guestrooms to provide guests with up-to-date hotel, events and promotion information. May incorporate functions of an integrated smart room solution.
F&B	10.	Breakfast Tracking	Solution enables outlet to retrieve guest's entitlement and consumption status by tapping key card on reader. It will reconcile charges automatically at the end of each breakfast service.
	11.	Online Reservation and Ordering	Solution allows guests to self- book and order food for dine-in or take-out directly via various platforms. Reservations and orders are directly updated to the POS and table management system of the restaurant.

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Hotel Functions	Types of Technology Solution		
F&B (continued)	12.	Mobile-ordering for Crew	Solution allows employees to take orders and complete payment at the table.
	13.	Table Queue Management	Electronic management of table bookings and occupancy.
	14.	Power Assisted Delivery	Power assisted delivery system aids staff in moving heavy loads safely and efficiently.
	15.	Data Analytics for Resource Optimization	Analyzes market trends, seasonal demands, and guest preferences to provide an actionable plan to improve productivity and generate new revenue.
	16.	Food Management	Leverages AI to monitor food availability along buffet lines to trigger replenishment. Analyzes food consumption patterns after each meal service.
	17.	Crowd Management	Leverages video analytics to understand queue patterns at outlets, especially during peak hours.
	18.	F&B Delivery Robots	Robots that deliver F&B to guests.
Engineering	19.	Building Management	Solution allows centralized control and monitoring of building's mechanical and electrical equipment such as ventilation, lighting, power systems, fire safety system, etc.
	20.	Data Analytics for Energy Optimization	Analysis of hotel equipment e.g., HVAC systems, to reduce energy consumption.
	21.	IoT-Based HVACs and Hotel Assets	Enhanced tracking and management of HVAC systems and hotel assets with IoT.
Security	22.	CCTV Security Analytics	Smart CCTV monitoring using video content analysis to help hotels automate CCTV surveillance of premises.
	23.	Visitor Management	Digital registration and tracking of visitors (e.g., suppliers, contractors, etc.) within the hotel premises.
Sales & Marketing	24.	Revenue Management System	Analyzes reservations data and demand trends, to help hotels optimize pricing and maximize profit.
	25.	Reputation Management/ Social Listening Tool	Tracks and monitors overall sentiment and satisfaction across multiple social media platforms. Enables hotel to provide timely responses to manage its reputation across multiple social channels.

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Hotel Functions	Types of Technology Solution		
Sales & Marketing (continued)	26.	Global Distribution System	The solution links services, rates and bookings across travel industry service providers, mainly airlines, hotels, car rental companies, and travel agencies, to enable transactions among service providers.
	27.	Events Layout Automation	Enable accurate and collaborative digital diagramming of suitable layouts for venue area and capacity.
	28.	MICE Sales and Event Management	Empower sales and catering teams to seamlessly contract new businesses, efficiently manage blocking of guest rooms and communicate details of event across departments.
	29.	MICE Group Reservations Management	Enables customisation of partners' event booking microsites that connects the hotel directly with event delegates. It allows automated and efficient workflow for contracting, upselling, rooming, and tracking reservation rate.
	30.	Augmented Reality/ Virtual Reality for Visualization	Provides potential guests with a realistic and interactive view of the property through an augmented or virtual environment.
Finance	31.	RFID Asset Tracking	Electronically track assets for accounting and reporting. Attach RFID tags to hotel assets to track and retrieve electronically-stored data through handheld devices.
	32.	Cloud-based Accounting Management	Manages accounting and simplifies financial operations across the organization.
Human Resource	33.	Employee Communication	Real-time unified communication for workforce. Allows secure one-to-one and group messaging, content management, engagement analytics, employee surveys and more.
	34.	Time and Attendance	Allows hotel to digitally track clock-in and clock-out of employees via biometrics, such as facial recognition, fingerprint, etc., to facilitate work schedules, payroll, and productivity management.
	35.	E-learning	Online learning platform where employees can conveniently login to access training courses via a computer/smart device anytime and anywhere

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Hotel Functions	Types of Technology Solution		
Human Resource (continued)	36.	Foreign Worker Accommodation Management	Virtually manage foreign worker's (FW) accommodation to ensure compliance with housing regulations by Ministry of Manpower. It allows workers to take and share photos of prevailing accommodation conditions with employers directly.
	37.	Labor Scheduling	Automate forecasting of labor and management of shift scheduling, and enable real-time updates of roster.
	38.	Candidate Management	Tools to enable video interviews, digital pre-screening assessment as well as resume and interview management. AI assistance in identifying talent and mapping behavioral assessments of candidates
Others	39.	Customer Relationship Management	CRM manages customers' data and helps to analyze their profiles, needs and preferences.
	40.	Internet of Things Enabled Inventory Management	Solution enables real-time tracking of inventory status and automates ordering process as required.
	41.	Data Analytics for Financial Forecasting and Budgeting	Analyzes room reservation data and demand trends, to help hotels accurately forecast and Budget financials, as well as automatically submit daily financial reports.
	42.	If not listed, please specify _____	

SINGAPORE

TABLE 172

INTERVIEW COUNT (SINGAPORE).

Count	Overall	Luxury	Upscale	Mid-tier	Budget
Quantitative	20	5	5	4	5
Qualitative*	18	5	5	2	5

* Incudes extra interview with hospitality developer (Far-East Organization)

Hotel Metrics

Efficiency Indicator: Revenue per Worker across Cities over Five Years

TABLE 173

OVERALL ANNUAL REVENUE PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	127,236	65,126	74,027	44,287	87,119	111,061	89,595
2016	128,963	64,640	73,126	45,593	87,412	106,414	94,468
2017	126,869	76,787	75,034	46,467	88,265	99,675	90,674
2018	145,839	81,480	82,080	48,416	84,057	99,987	90,240
2019	170,607	80,930	81,537	59,903	107,687	130,722	111,507
Average	139,903	73,793	77,161	48,933	90,908	109,572	95,297
Growth between 2015 and 2019	34%	24%	10%	35%	24%	18%	24%

Across all cities, hotels in Seoul, Singapore, and Tokyo have the highest revenue per worker. Overall, hotels in Singapore have the highest revenue per worker, indicating high productivity.

Comparing all cities, Singapore has the highest level of government intervention and support for the hotel industry. The government's push for productivity encouraged many hotels to embark on riskier and costlier investments to increase efficiencies. Hotels have account managers with the Singapore Tourism Board, which also conducts industry workshops to make productivity a key performance indicator across the sector. Further, through its provision of grants, hotels across most tiers have been able to invest in some form of technology to improve process efficiencies or the guest experience. Hotels in the rest of the region trail behind those in Singapore because cost considerations make most technologies out of reach for most hotels.

In the absence of the government as a safety net in other cities, technology innovations are often led by international chain hotels in the luxury and upscale segments. Bigger hotels with an international presence can more easily make investments due to favourable economies of scale that

allow them to seek better contracts with suppliers. These hotels are often at the forefront of technology adoption, with a smaller budget and mid-tier hotels following suit much later.

Apart from the high level of productivity, there is also a growth in tourism in Singapore.

TABLE 174

NUMBER OF INBOUND TOURIST IN SINGAPORE.

Country	Year				
	2015	2016	2017	2018	2019
Singapore	15,231,469	16,403,459	17,424,611	18,508,302	19,116,016

Source: Singapore Tourism Analytics Network

During the last five years, there has been a healthy growth in tourism in Singapore. This has a direct impact on the overall hotel industry. However, considering the city's growth from 2015 to 2019, the study indicates a slower year-on-year growth of 7.6% in 2016, 6% in 2017 and 2018, and 3% in 2019. This in part can be attributed to increased competition from other cities in Southeast Asia as attractive tourist destinations. Further, Singapore is often considered a travel hub for the region, serving as a bridging destination for travel to neighbouring cities.

TABLE 175

ANNUAL REVENUE PER WORKER IN SINGAPORE (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	120,682	126,219	144,484	61,369
2016	121,653	124,364	152,616	62,187
2017	130,110	127,779	128,515	67,253
2018	131,993	143,159	151,704	82,710
2019	135,251	196,728	163,242	93,422
Average	127,938	143,650	148,112	73,388
Growth Between 2015 to 2019	12%	56%	13%	52%

The study indicates a gradual increase in each hotel tier during the last five years. A segment-wise analysis points out that revenue per worker for luxury, upscale, and mid-tier hotels is significantly higher than budget hotel. The higher revenue per worker in these three hotel segments may be due to higher ARR and productivity.

Productivity Level Differs across Different Tiers

While productivity remained a core metric across all hotels surveyed, it was observed that hotels of different tiers understand productivity differently.

Luxury hotels repeatedly emphasize that the key productivity driver is the guest experience. For example, Marina Bay Sands stresses that customer satisfaction is the key consideration during decision-making when adopting new technologies or operational best practices. The guest experience is a core aspect of product differentiation for luxury hotels, with Intercontinental (an international luxury hotel group) stressing that customers continue to seek out rooms at their

properties due to expectations of high service standards. Since guest experience is a critical component of the product offering of luxury hotels, productivity in this segment is closely intertwined with customer satisfaction.

In the mid-tier and budget segments, productivity is commonly associated with time and cost savings. As target customers for hotels in this segment are extremely price-sensitive, managers in these hotels are concerned about driving costs down to increase competitiveness and boost revenue. Hence, mid-tier and budget hotels in Singapore continue viewing productivity in terms of capital and manpower savings.

As such, productivity and profitability are perceived to be higher in luxury, upscale, and mid-tier hotels than in budget hotels.

Labor Productivity Indicator: Value add per Worker across Cities over Five Years

TABLE 176

OVERALL ANNUAL VALUE ADD PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	86,383	31,908	47,300	29,691	68,988	91,646	65,053
2016	87,357	34,061	47,555	32,296	70,304	87,340	65,207
2017	88,843	38,583	49,314	30,624	72,295	83,197	62,010
2018	101,230	42,199	55,860	31,899	68,706	82,753	61,696
2019	114,555	38,111	55,370	37,792	86,961	103,824	73,775
Average	95,674	36,972	51,080	32,461	73,451	89,752	65,548
Growth Between 2015 to 2019	33%	19%	17%	27%	26%	13%	13%

A positive correlation between revenue per worker and value add per worker is noted, with three cities (Seoul, Singapore, and Tokyo) emerging with the highest average. Well-developed cities have a higher value add per worker when compared with developing cities. Singapore witnesses the highest value add per worker across all cities due to its labor pool shortage. The factors as mentioned in the section ahead explains the key reasons for this shortage.

Singapore Macro-environment Affects Manpower Pool

Singapore faces a unique challenge, where the majority of the population is highly qualified but inclined to take on less labor-intensive roles. This has led to a lack of local talent in the hospitality industry. To reduce the manpower shortage, hotel managers tend to rely heavily on workers from neighbouring countries such as Malaysia and China.

Since 2012, there has been an inventory spike as the hotel industry has boomed with the opening of new hotels in anticipation of growth in tourism. This has been further supported as seen in the continuous growth in the number of tourists. Along with this, service apartments and industry disruptors such as Airbnb have offered travelers a plethora of choices. The ease of hotel regulation has also contributed to the growth in the number of available rooms. It is estimated that the number of rooms in Singapore increased from 20,000 in 2012 to 70,000 in 2020.

With the influx of new hotels, many existing hotels have reduced room tariffs to fight for their market share. The opening of new hotels, coupled with the tightening of foreign labor policy due to the Dependency Ratio Ceiling, has led to a manpower crunch. The shortage in an already limited manpower pool has steered STB to introduce the Industry Transformation Plan, which had the goal of building digital and innovative initiatives to increase productivity. The initiative has pushed automation and digital transformation in the hotel industry. Intuitive and intensive work has slowly become obsolete in their ability to bring about a leaner operation process.

Productivity is Perceived to be Highest in Mid-tier Segment

TABLE 177

ANNUAL VALUE ADD PER WORKER IN SINGAPORE (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	80,889	90,749	104,099	34,397
2016	82,940	90,063	106,854	35,139
2017	89,075	92,940	88,470	38,808
2018	96,544	105,571	102,449	49,139
2019	91,800	143,977	108,270	54,933
Average	88,249	104,660	102,028	42,483
Growth Between 2015 to 2019	13%	59%	4%	60%

Value add per worker is a measurement of labor productivity. This study observes that upscale and mid-tier hotels have the highest value add per worker and productivity levels across all hotel tiers.

Productivity has the highest value to upscale hotels because they wish to ensure that customers receive quality service. Bearing this in mind, efficiency and time spent on jobs are reported as the most important metrics in achieving productivity goals, especially in the mid-tier sector. Productivity is also a supporting tool that enhances a customer's overall experience and service for luxury and upscale hotels. It ensures that tasks are executed efficiently and allows more time for servicing and interaction with customers.

Low Adoption of Technologies among Budget and Small-scale Hotels

Value add per worker has the lowest value among the budget hotels, which indicates low productivity in this tier. While value add per worker is lowest in the budget segment, it does not necessarily reflect lower productivity levels because budget hotels practice cross-functional job delegation. The lower level of productivity may be an indication of a lower level of technology adoption.

Budget hotels are less inclined to adopt new technology due to low economies of scale. Unlike branded hotels in the luxury and upscale category, the strategies and tasks for a budget hotel tends to be simpler, more intuitive, and easily fulfilled by labor. These budget hotels also tend to provide only the necessities for a hotel stay because they are built smaller and their target markets are backpackers or low-budget tourists.

Compared to luxury and upscale hotels, some budget hotels are managed by less educated hotel managers with a traditional mindset. These hotels are set up by owners as a side business to receive tax grants from the business operation. Hence, they have a lower inclination to adopt or improve business operations as their goal is just to ensure that the hotel remains open.

Profitability Indicator: Gross Operating Profit per Worker across Cities over Five Years

TABLE 178

OVERALL ANNUAL GROSS OPERATING PROFIT PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	54,683	32,865	26,842	28,735	75,197	69,297	55,102
2016	55,558	33,870	24,872	31,806	67,310	66,899	55,963
2017	57,888	37,464	26,069	30,461	68,655	65,001	56,293
2018	57,888	41,175	32,018	32,770	65,645	69,322	53,075
2019	66,816	38,827	32,084	39,372	90,316	84,729	66,175
Average	82,995	36,840	28,176	32,359	72,669	70,494	57,073
Growth Between 2015 to 2019	22%	18%	20%	37%	20%	22%	20%

Gross operating profit per worker is measured as the profitability generated by each worker. Higher profitability across well-developed cities is observed across all cities, particularly in Hong Kong, Singapore, and Tokyo.

Gross Operating Profit per Worker by Tier over Five Years (Singapore)

TABLE 179

ANNUAL GROSS OPERATING PROFIT PER WORKER IN SINGAPORE (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	47,293	60,017	59,416	34,397
2016	50,176	59,469	60,038	35,139
2017	52,923	62,435	59,237	38,808
2018	52,923	62,435	59,237	38,808
2019	66,255	71,825	55,626	49,139
Average	69,737	98,148	72,216	54,933
Growth Between 2015 to 2019	40%	20%	-6%	43%

Upscale hotels have the highest gross operating profit per worker across all tiers. This indicates that high profitability is generated by each employee due to a higher ARR. Our analysis reveals that the upscale segment has the highest value add per worker, indicating high productivity in this segment.

The higher gross operating profit per worker may also indicate higher profitability in luxury, upscale, and mid-tier segments. A higher profit margin, excellent service standards, and customer experience have been the key focus of several luxury and upscale hotels. Quality management partly entails using technology to help service staff create a pleasurable customer experience. Most hotels in Singapore have put some system in place to predict, track, review, and analyze services rendered to guests. While some properties rely on survey-based systems to understand guest preferences, others

have adopted chatbots to interact with guests in real-time. In the luxury segment, where highly personalized and intuitive service is a core part of the hotel's product offering, these systems allow hotels to predict and respond to customer preferences. In contrast, budget hotels have a significantly lower gross operating profit per worker and value add per worker. While lower gross operating profit per worker and value add per worker may lead to lower productivity, budget hotels leverage cross-deployment and employee upskilling as their key approach to improving productivity.

Efficiency Indicator: Operating Cost per Worker across Cities over Five Years

TABLE 180

OVERALL ANNUAL OPERATING COST PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40,854	33,218	26,727	14,596	18,131	19,415	24,542
2016	41,607	30,579	25,570	13,297	17,108	19,074	29,261
2017	38,026	38,204	25,720	15,843	15,970	16,478	28,665
2018	44,609	39,281	26,220	16,517	15,351	17,234	28,545
2019	56,051	42,819	26,167	22,111	20,726	26,898	37,731
Average	44,229	36,820	26,081	16,473	17,457	19,820	29,749
Growth Between 2015 to 2019	37%	29%	-2%	51%	14%	39%	54%

The operating cost per worker is an efficiency ratio that measures expense per employee. Bangkok, Singapore, and Tokyo have the highest operating costs per worker. Operating costs per worker in Singapore are relatively at par with those in Bangkok. The higher operating costs may be due to higher purchasing power parity.

Operating Cost per Worker by Tier over Five Years (Singapore)

TABLE 181

ANNUAL OPERATING COST PER WORKER IN SINGAPORE (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	39,794	35,470	40,385	28,069
2016	38,713	34,301	45,762	27,835
2017	41,035	34,839	40,045	21,090
2018	35,449	37,589	49,254	34,914
2019	43,451	52,751	54,972	40,217
Average	39,688	38,990	46,084	30,425
Growth Between 2015 to 2019	9%	49%	36%	43%

The higher operating costs per worker in the mid-tier segment may be due to higher cost of investment.

Profitability Indicator: Average Room Rate across Cities over Five Years

TABLE 182

OVERALL AVERAGE ROOM RATE (IN USD).

	Bangkok	Singapore	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	207	141	158	119	169	160	186
2016	202	136	154	125	178	164	230
2017	197	144	152	116	177	159	226
2018	193	149	145	131	194	154	255
2019	195	132	140	116	179	156	259
Average	199	140	150	121	179	159	231
Growth Between 2015 to 2019	-6%	-7%	-12%	-3%	6%	-2%	39%

The average room rate is the measurement of room rates generated by occupied rooms. Singapore and Tokyo have the highest ARR in comparison to other cities because of higher living expenses.

Average Room Rate by Tier over Five Years (Singapore)

TABLE 183

AVERAGE ROOM RATE IN SINGAPORE (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	273	281	154	91
2016	273	273	145	89
2017	281	254	136	91
2018	281	254	138	98
2019	288	254	139	101
Average	279	263	143	94
Growth Between 2015 to 2019	5%	-9%	-10%	11%

A review of the Singapore market indicates hotels in the luxury and upscale segments have the highest ARR. There is a slight difference between the price points of luxury and upscale hotels as both tiers prioritize quality service and prestige. Target groups are often business travelers or customers with higher purchasing power. Hence, with a higher price positioning, many hotels provide personalized service and care to their target market. Similarly, budget hotels have lower ARRs as many of the target groups within this segment have different expectations in terms of service and stay.

Profitability Indicator: Revenue per Available Nights (RevPAR) across Cities over Five Years

TABLE 184

OVERALL RevPAR (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	150	125	129	87	129	101	124
2016	149	107	128	90	131	110	141
2017	141	133	123	90	136	110	138
2018	146	122	114	98	165	107	164
2019	149	101	115	87	149	111	138
Average	147	118	122	90	142	108	141
Growth Between 2015 to 2019	-1%	-19%	-11%	0%	16%	10%	12%

RevPAR is a profitability ratio used to measure a room's revenue generated from rooms available. Tokyo and Singapore have the highest RevPAR. It is also observed that Kuala Lumpur has the lowest RevPAR across all cities.

RevPAR by Tier over Five Years (Singapore)

TABLE 185

RevPAR IN SINGAPORE (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	193	188	129	68
2016	201	184	124	64
2017	218	157	124	67
2018	228	176	120	58
2019	216	182	123	75
Average	211	177	124	66
Growth between 2015 and 2019	12%	-3%	-5%	11%

RevPAR corresponds to the ARR analysis in this study indicating that luxury and upscale hotels in Singapore have the highest RevPAR.

Utilization Indicator: Average Occupancy Rate across Cities over Five Years

TABLE 186

OVERALL AVERAGE OCCUPANCY RATE.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	85%	82%	71%	71%	81%	84%	83%
2016	86%	81%	72%	72%	85%	85%	82%

(Continued on next page)

(Continued from the previous page)

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2017	84%	80%	71%	72%	86%	87%	83%
2018	87%	83%	71%	66%	86%	83%	84%
2019	87%	80%	71%	65%	79%	89%	85%
Average	86%	81%	71%	69%	83%	86%	84%
Growth Between 2015 to 2019	2%	-2%	0%	-8%	-2%	6%	2%

The average occupancy rate measures the number of rooms occupied and divides it by the number of rooms available. The average occupancy rate is highest in Asia's top tourist destinations of Bangkok, Hong Kong, Singapore, and Tokyo. According to the Singapore Tourism Analytical Network [14], the average occupancy rate stands at 85% across five years, which is relatively in line with the findings of this study.

Average Occupancy Rate by Tier over Five Years (Singapore)

TABLE 187

AVERAGE OCCUPANCY RATE IN SINGAPORE.

	Luxury	Upscale	Mid-tier	Budget
2015	100%	90%	82%	81%
2016	79%	90%	84%	79%
2017	81%	86%	82%	80%
2018	81%	90%	85%	75%
2019	79%	89%	88%	82%
Average	84%	89%	84%	79%
Growth Between 2015 to 2019	-21%	-1%	7%	2%

During the last five years, AOR has increased gradually and maintained a healthy volume of 80%, except in 2017. The upscale and mid-tiers have experienced a relatively high AOR across all tiers during the five years. The high occupancy rates within the upscale and mid-tier segments are due to their affordable price points and comfort.

Perception of Productivity in Singapore

As labor costs and guest expectations increase, hotel managers have identified three main areas of productivity as critical to ensuring optimal performance. This includes customer satisfaction, time savings, and cost savings. Productivity in the hotel industry is the highest quality of service rendered with the least amount of time and capital input. As a service-oriented industry, improving customer satisfaction is of utmost importance because hotels strive to provide the best possible service while maximizing labor and time efficiencies.

Across the board, productivity is seen as a core metric for measuring hotel business performance. Managing manpower is one of the critical challenges faced by hotels in Singapore. The industry is unavoidably labor-intensive, but the size of the local pool and cultural attitudes have made labor productivity a core concern for hotels in the city. Managers stress that local cultural attitude has long stigmatized hospitality jobs, breeding a reluctance to work in the industry. Hence, hotels have been largely reliant on foreign labor and have remained vulnerable to labor flow disruptions. Thus, hotels in Singapore continue to explore technologies to reduce their reliance on labor. Hence, hotels in Singapore have a critical dependency on efficient and productive use of their workforce.

Singapore emerges ahead of other cities in terms of productivity. With strong government support for increased hotel investment in technology and training, hotels in the city have adopted the government's push to make the industry efficient and productive. For example, Copthorne King's Hotel has worked closely with A*STAR and McKinsey to find ways to re-examine productivity gaps to automate business processes. Emerging technologies, such as IoT and RFID, have been incorporated into processes to reduce manpower reliance.

Technology plays a unique role for the hotel in the city, as both parts of the property's product offering and as a key part of business operations. In the absence of this level of support from local governments, hotels in other cities lag behind Singapore hotels in adopting technology. In fact, Singapore acts as an incubator for innovative technology adoption in the region.

Key Motivators for Productivity in Singapore

Across the board, general managers unanimously agree that productivity is critical to ensure operational sustainability in Singapore's hotel industry. This condition arises due to two main drivers in the Singapore market: high employee turnover and a lack of skilled employees.

High employee turnover has emerged as a core concern of general managers as they strive to ensure manpower is efficiently deployed across core business segments. Singapore has a limited pool of hospitality workers due to its naturally small population size and the cultural reluctance to take up hospitality sector jobs. These constraints have forced hotels to employ labor from overseas markets. This gives rise to transient employment because employees must return to their country after some time and hotels have to continuously invest in training new employees.

The lack of sufficiently-skilled labor is another challenge for general managers. Since majority of graduates in Singapore attend local tertiary institutions, there is a mismatch of skills between graduates from these institutions and the industry's needs. Local graduates are neither trained for the skills needed by the hotels nor possess the mindset required for the hospitality sector. Hence, they are unable to take up roles in the industry. This mismatch of skills is further complicated by the mismatch of expectations of local graduates, with many general managers claiming that local graduates are unable to easily fit in to the service-oriented mentality needed in the industry. Further, they are unaware of the realities of starting positions in the hospitality industry. Hence, most hotels in the city rely on graduates from dedicated hospitality training institutes, such as SHATEC, to groom and train hospitality talent.

In short, productivity is critically input-driven and the quality of input determines the ability of the organization to ensure productivity. In this case, the quality of skilled labor and the industry's ability to ensure a sustainable supply of it is critical to retaining productivity.

Key Inhibitors: Technology Acts as a Double-edged Sword

Technology has brought about a multitude of benefits, but it needs to be used with caution and with service as a core success metric. Technology adoption may not serve its intended purpose if there is a lack of customer acceptance and understanding about the innovation by the hotel. For example, Marina Bay Sands (MBS) adopted a self-service kiosk to reduce manpower size and queuing time. To increase adoption rate, MBS educates its customers to actively use the self-service kiosk through its mobile app and incentivizes them through rebate points and vouchers. However, the technology has low adoption rate due to the lack of service and human interaction.

Key Inhibitors: Technology will not be Able to Replace Humans

Technology such as robotic cleaning machines will not be able to replace a human's ability to make decisions. This is clear from a statement in response to the qualitative question whether a robot handling liquid can detect the difference between urine, water, and blood, and what will the next call of action for the different liquid types. According to the response statement, while cleaning robots can massively reduce the workload and chores a housekeeper needs to complete, it will still require a supervision by humans because the robot does not have the intellectual capacity to make decisions in different situations.

Best Practices Driving Productivity in Singapore

Apart from technology, the hotels in Singapore have devised various non-technology-based practices to streamline business operations and boost productivity.

Upskilling Employees

Upskilling employees can achieve greater productivity by producing a flexible workforce that more efficiently adapts to changing hotel and customer needs. Typically, hotels in Singapore have different peak periods that vary across departments, such as housekeeping and front office, where check-in periods may not coincide with room turnover needs. For example, Copthorne King's Hotel Singapore has revamped the entire hotel service blueprint to focus on the following areas.

1. Job redesign: It combines two jobs that are at the same level.

2. Job stacking: It combines two jobs at different levels; for example, combining housekeeping and stewarding into one service.

3. Job segmenting: It includes taking portions of a job and making it into a new role; for example, combining F&B, room, and sales administration to enable staff to complete more tasks of different job functions and roles.

4. Increasing job benefits by providing upskilling and opportunities for a second career, progressive wage increases, and incentive to do more.

5. Streamlining the organizational structure by clubbing two reporting officers.

When staff can be trained to perform different roles, teams are able to move with shifting demand and bridge productivity gaps.

Adoption of Technology to Drive Productivity

Hotels in Singapore have also relied on integrated property management solutions, such as HOTSOS, to enhance manpower deployment and ensure time efficiencies. This is particularly the case for hotels with large properties, such as Hilton, MBS, and Oakwood. These hotels rely on the solutions for forecasting to assess needs for staff and manage effective deployment. These technologies simplify decision-making and enable the hotels to make more informed, operational decisions. The solutions have also helped the hotels save time due to their rigorous tracking mechanism. This has translated into better staff performance since it has consistent target-setting built into the personnel management systems. Integrated property management system has also been critical to improving hotel labor productivity.

Back-office functions in Singapore's hotels have also drawn from technology to spearhead productivity. Finance and revenue management software emerge as popular technologies supporting productivity in the city hotels. Streamlining finance operations has been a key opportunity for hotels in Singapore to free up employee time so that they can focus on other revenue-generating functions.

1. The Warehouse Hotel, for example, highlights that its move to an integrated, cloud-based invoicing system allowed employees to more readily respond to suppliers and easily access management decisions, cutting down on unnecessary paperwork and reducing time taken to process decisions.

2. Naumi Hotel has also introduced cloud-based technology across its properties that enables teams to increase data visibility across different functions and locations. This allows management decisions to be made with proper support. Further, data on the cloud is updated in real time, eliminating the need to chase employees. The hotel has also reduced the number of accountants from two to one. These systems have allowed hotels to modernize and streamline back-office functions to improve employee productivity.

3. Copthorne King's Hotel Singapore has integrated new Smart Room control technology. The integration of Energy Management System and Smart Room Control System leverage IoT, digitalization, and AI to allow hotels to reduce the number of employees required. The use of such technological devices allows automate and transmit real-time data, inducing appropriate calls to action.

4. Kempinski Hotel embarked on an initiative this year that sends surveys to guests before and after their stay in addition to a WhatsApp chat bot that operates during their stay. The pre-stay questionnaire collects customer preferences such as beverage choices, view, and preferred mattress type so that the hotel can prepare ahead for their guest's arrival. During their stay, the guest can interact with the chatbot using the QR code provided in their hotel room. This collects any feedback for housekeeping or any other service function to address, allowing for reputation management and service recovery should there have been any lapses during the stay. The post-stay survey collects feedback from guests about their experience at the hotel.

In the same way that the perception of productivity differs by tiers, technology positioning in customer-facing settings also differs. Wi-Fi and in-room smart technology have become commonplace across all tiers, while luxury and upscale tiers have utilized smart technology and

connectivity to forge closer bonds with guests. These hotels use the opportunity to offer more personalized services as a way of adding to the luxury experience. This differs from the approaches of mid-tier and budget hotels, which have increasingly relied on smart technology to reduce the man-hours spent on guest interaction and drive cost savings.

Studying of Existing Gaps to Drive Productivity

Apart from implementing technology, hotels leverage external consultancy support to identify existing productivity gaps. Copthorne has embarked on a five-year technology roadmap plan to enhance and increase productivity profitability and operations. It engaged McKinsey and A*STAR to review productivity gaps to automate business processes. The investment cost including renovation, guest experience improvement, technology, and consultation from the respective institute is said to be USD14 million[9]. The key objectives of this roadmap are talent development, resource reallocation, productivity optimization, and product and service blueprint.

Impact of COVID-19

As a global hub in a small city-state, the industry has long counted on international travelers as its key customer base. COVID-19-related travel restrictions have drastically dampened travel inflows to Singapore, shrinking demand for hotels across all tiers.

Further, even as domestic demand for recreational stays and work-from-hotel options picks up incrementally, hotels are faced with large-scale manpower shortages. Singapore hotels have been reliant on foreign labor due to the small labor pool and cultural reluctance to take up jobs in the service sector. With COVID-19, the labor movement has been largely curtailed and managers have repeatedly reiterated that existing manpower capacity is consistently strained even with limited demand. Foreign labor has been kept at bay due to government restrictions following the worsening COVID-19 situation.

COVID-related Countermeasures

Cleanliness and sanitation have become one of the most important areas of consideration in the current COVID-19 climate. Hotels now have had to adapt to ensure guest safety during the pandemic. Most hotels in the city have sought some form of international sanitation and safety accreditation to boost customer confidence in their operations. Hotels in Singapore have also had to deploy already-strained manpower into social distancing and temperature-monitoring roles to ensure that guests enter and utilize their spaces responsibly and safely.

The vast majority of hotels here have put packages in place to appeal to the domestic market. Staycations have been a common strategy for the vast majority of hotels, with some offering F&B credits to boost revenues at other establishments within the hotel. Some hotels, such as Kempinski Hotel, further report that F&B businesses have seen a greater uptick in revenue from previous years as a spin-off result of increased domestic demand. Further, some hotels have also put work-from-hotel packages in place to attract working guests during the day. These efforts have been further boosted by travel credits offered by the government to Singaporeans.

While the hotel business has slowly picked up, many hotels in the luxury segment are struggling more than other tiers. They will have to keep their prices low to attract customers while providing the same standard of service. It is likely that the recovery rate will remain slowest for this group and their profit margins will be greatly affected.

[9] Based on a qualitative interview conducted with respondents from Copthorne King's Hotel.

Industry Outlook and Trends in a Post-COVID-19 Era

All hotels surveyed unanimously agree that the resumption of international travel is critical to business recovery. Most managers continue to express reservations about the long-term sustainability of domestic demand because repeat domestic staycation guests are rare and the novelty is expected to wear off. Hence, the domestic market will not be able to sustain the industry for long.

Most managers have also felt that the customer's increased focus on sanitation will continue well past COVID-19. Hotels in the future will be expected to continue to adapt with the increased focus on sanitation and hygiene.

BANGKOK

TABLE 188

INTERVIEW COUNT (BANGKOK).

Count	Overall	Luxury	Upscale	Mid-tier	Budget
Quantitative	20	5	5	5	5
Qualitative	16	5	5	5	1

Hotel Metrics

Efficiency Indicator: Revenue per Worker across Cities over Five Years

TABLE 189

OVERALL ANNUAL REVENUE PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	127,236	65,126	74,027	44,287	87,119	111,061	89,595
2016	128,963	64,640	73,126	45,593	87,412	106,414	94,468
2017	126,869	76,787	75,034	46,467	88,265	99,675	90,674
2018	145,839	81,480	82,080	48,416	84,057	99,987	90,240
2019	170,607	80,930	81,537	59,903	107,687	130,722	111,507
Average	139,903	73,793	77,161	48,933	90,908	109,572	95,297
Growth Between 2015 to 2019	34%	24%	10%	35%	24%	18%	24%

Revenue per worker indicates revenue generated by each employee. Across all cities, Singapore, Seoul, and Tokyo hotels have the highest revenue per worker. In Bangkok, the revenue per worker is relatively high compared to hotels in other developing cities.

Over the years, Thailand has been the top tourist destination in Southeast Asia due to government initiatives and efforts to promote the country as a top traveling hub. Respondents collectively report strong support from government agencies, such as the Thailand Incentive and Convention Association (TICA), the Tourism Authority of Thailand (TAT), and the Thailand Convention and Exhibition Bureau (TCEB). These organizations have supported the industry through overseas road shows and tourism projects. While no grants or subsidies are provided, the government actively promotes opportunities for hotels to join tourism campaigns. Apart from attracting foreign tourists, TCEB has actively promoted more business traveling due to higher spending power compared to foreign tourists.

TABLE 190

NUMBER OF INBOUND TOURISTS IN THAILAND.

Country	Year				
	2015	2016	2017	2018	2019
Thailand	29,923,000	32,530,000	35,592,000	38,178,000	39,916,251

Source: Ministry of Sport and Tourism, Thailand; Statista.

Table 190, Number of Inbound Tourists in Thailand, shows a progressive increase in the number of inbound tourists, signifying a tourism industry boom over the past five years. There was a steady year-on-year growth rate of 8% from 2015 to 2018 before a slight dip from 2018 to 2019 at 5% due to political strife. The growth in the tourism industry is linked to the high revenue per worker in hotels.

Revenue per Worker by Tier over Five Years (Bangkok)

TABLE 191

ANNUAL REVENUE PER WORKER IN BANGKOK (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	95,874	40,728	57,570	30,720
2016	98,311	42,864	56,050	33,970
2017	125,704	46,299	54,206	32,741
2018	133,381	46,801	58,764	34,965
2019	160,106	41,798	62,248	35,310
Average	122,675	43,698	57,768	33,541
Growth Between 2015 to 2019	67%	3%	8%	15%

Looking at each tier, the luxury segment has the highest revenue per worker while budget and upscale segments have lower revenue per worker. This may be due to higher ARR from the luxury segment compared to other tiers, resulting in higher revenues generated per worker.

Labor Productivity Indicator: Value Add per Worker across Cities over Five Years

TABLE 192

OVERALL ANNUAL VALUE ADD PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	86,383	31,908	47,300	29,691	68,988	91,646	65,053
2016	87,357	34,061	47,555	32,296	70,304	87,340	65,207
2017	88,843	38,583	49,314	30,624	72,295	83,197	62,010
2018	101,230	42,199	55,860	31,899	68,706	82,753	61,696
2019	114,555	38,111	55,370	37,792	86,961	103,824	73,775
Average	95,674	36,972	51,080	32,461	73,451	89,752	65,548
Growth Between 2015 to 2019	33%	19%	17%	27%	26%	13%	13%

Singapore, Seoul, and Tokyo emerged with the highest averages. The value-add per worker for Bangkok is at par with other developing cities and stands at an average of USD37,962 over the past five years. Developing cities still rely heavily on traditional ways of operation compared to

developed cities due to lower productivity readiness. The below section explains the reasons for slower productivity growth in Bangkok.

Lack of Initiatives and Government Support on Productivity

While there is strong government support to boost tourism in Bangkok, there is a lack of initiatives that push productivity forward as the nation is still undergoing industrial and social transformation. Thailand is still focused on increasing the employability rate and equipping the labor market with the right skill sets as it progresses to further its economic standing. Unlike well-developed countries such as Singapore, which has a technology and digital infrastructure, Thailand has just moved into Smart Nation 4.0 with a focus on digital readiness and sensorization. Hence, productivity through digitalization and technology adoption is still nascent in Bangkok.

Abundant Manpower to Support Labor Intensive Roles

Unlike Singapore, Thailand's labor pool has diverse skill sets and different educational levels. The diversity of its capabilities has allowed Bangkok to have adequate manpower to perform the task of different technicalities. Often, people from rural areas make the highest composite for the manpower in Front Office, Housekeeping, and F&B functions.

The lack of productivity readiness and abundant manpower has reduced productivity gains.

TABLE 193

ANNUAL VALUE ADD PER WORKER IN BANGKOK (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	31,908	37,000	33,651	18,515
2016	34,061	39,305	38,228	20,485
2017	38,583	50,306	36,532	20,106
2018	42,199	53,430	41,362	22,950
2019	38,111	58,816	42,088	23,438
Average	36,972	47,771	38,372	21,099
Growth between 2015 and 2019	19%	59%	25%	27%

Higher Staff to Guest Ratio in the Luxury and Upscale Segment

Looking at value-add per worker, luxury hotels have a higher value-add per worker compared to other segments due to higher ARR. Upscale hotels have lower value-add per worker compared to other hotel tiers. This is due to the higher FTEs deployed in upscale hotels. Looking at the number of employees in a hotel annually, the luxury and upscale segments have a significantly higher number of employees compared to all other tiers, indicating a higher staff-per-guest ratio in the two tiers.

Lower Productivity in Frontline Operations

Collectively, we note a higher emphasis on service quality and customer satisfaction within the luxury and upscale segment in exchange for the premium price. The pace of productivity is dependent on the type of hotel function.

Across the board, the frontline service crew focused their efforts and resources predominantly on service quality and customer satisfaction to ensure and secure their customer retention rates. In particular, the

luxury segment places significance on setting a "slow pace" to understand customers' tastes, preferences, and needs while putting them at ease when they first arrive in the hotel. This service touch point is crucial in ensuring customer satisfaction and as a result, may lead to repeat customers. At this point, innovation and the creative input of technology are limited. The service blueprint in the hotel industry has witnessed drastic changes with the incorporation of new technologies and procedures within the back-end operations to support the overall frontline staff and other hotel functions.

Back-end Operations support Frontline Service Staff

While there is limited change in frontline operations, the hotel industry has witnessed drastic changes in the back-end operations, after incorporating new technologies and procedures to ensure seamless transitions between processes and departments. Adopting hotel management systems allows the back end to support frontline operations by understanding and evaluating customers' needs and preferences.

The service blueprint in the back-end office area has altered drastically with new technology and innovative changes that help hotels understand customers' needs, preferences, and tastes. Systems such as customer relationship management tools are put in place to profile and understand the customer through Big Data and trends. Incorporating such new systems allows hotels to identify existing service gaps and new customer segments.

- Across the board, systems are implemented to identify new potential markets by drawing key data and trends to design new ideas that will help hotels stay ahead of the competition. Tools such as customer databases, customer revenue management tools, and sales forces are pivotal in supporting these activities. Adopting these technologies also helps reduce human error.

- Tools such as property management systems like Oracle and Opera support hotel operations by forecasting the manpower needed to ensure a hotel can run efficiently.

- Hotel managers report that more hotels have been digitized than ever before due to the influx of new applications and online travel agencies.

As hotel operations evolve seamlessly into new technology systems, it is important to note that innovation and creativity are more suited for back-end operations compared to frontline operations. While robotic cleaning machines and self-service check-in kiosks may be a novelty in hotel frontline operations, many hotels are reluctant to implement these new technological gadgets due to concerns about their effectiveness and accuracy.

Efficiency Indicator: Operating Cost per Worker across Cities over Five Years

TABLE 194

OVERALL ANNUAL OPERATING COST PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40,854	33,218	26,727	14,596	18,131	19,415	24,542
2016	41,607	30,579	25,570	13,297	17,108	19,074	29,261
2017	38,026	38,204	25,720	15,843	15,970	16,478	28,665

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	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2018	44,609	39,281	26,220	16,517	15,351	17,234	28,545
2019	56,051	42,819	26,167	22,111	20,726	26,898	37,731
Average	44,229	36,820	26,081	16,473	17,457	19,820	29,749
Growth between 2015 and 2019	37%	29%	-2%	51%	14%	39%	54%

The operating costs per worker are significantly higher in Bangkok compared to those in other developing cities such as Kuala Lumpur and Taipei. This may stem from the higher operating cost needed to support the higher revenue growth in the industry.

Operating Cost per Worker by Tier over Five Years (Bangkok)

TABLE 195

ANNUAL OPERATING COST PER WORKER IN BANGKOK (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	58,875	23,710	23,919	8,217
2016	59,006	23,480	17,822	8,453
2017	75,399	25,197	17,674	7,757
2018	79,951	24,180	17,402	5,975
2019	101,290	28,507	20,161	5,732
Average	74,904	25,015	19,396	7,227
Growth between 2015 and 2019	72%	20%	-16%	-30%

TABLE 196

ANNUAL NUMBER OF HOTEL ROOMS BY TIERS IN BANGKOK.

Tiers	Number of Rooms
Luxury	314
Upscale	349
Mid-tier	261
Budget	166

The operating costs per worker are significantly higher in the luxury segment. It may be due to the availability of more rooms, as seen in Table 196, Annual Number of Hotel Rooms by Tiers in Bangkok, leading to an increase of manpower and resource to support the higher volumes of

customer flow. As the luxury segment has higher standards across all tiers, the higher operating costs may also require more training to ensure staffs are well-trained with the right skill sets and service standards. Additionally, higher operating costs may also mean more refined and quality ingredients or resources are used with each guest.

Profitability Indicator: Gross Operating Profit per Worker across Cities over Five Years

TABLE 197

OVERALL ANNUAL GROSS OPERATING PROFIT PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	54,683	32,865	26,842	28,735	75,197	69,297	55,102
2016	55,558	33,870	24,872	31,806	67,310	66,899	55,963
2017	57,888	37,464	26,069	30,461	68,655	65,001	56,293
2018	57,888	41,175	32,018	32,770	65,645	69,322	53,075
2019	66,816	38,827	32,084	39,372	90,316	84,729	66,175
Average	82,995	36,840	28,176	32,359	72,669	70,494	57,073
Growth between 2015 and 2019	22%	18%	20%	37%	20%	22%	20%

Bangkok is comparatively at par with developing cities, while developed cities have significantly higher gross operating profit per worker in the hotel sector. This is evident from the lower productivity in developing cities compared to developed cities.

Annual Gross Operating Cost per Worker by Tier over Five Years (Bangkok)

TABLE 198

ANNUAL GROSS OPERATING COST PER WORKER IN BANGKOK (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	50,991	14,659	35,217	18,515
2016	53,231	16,920	35,396	20,485
2017	60,257	18,386	33,588	20,106
2018	65,047	19,859	38,031	22,950
2019	73,337	16,727	38,844	23,438
Average	60,573	17,310	36,215	21,099
Growth between 2015 and 2019	44%	14%	10%	27%

Looking at the overall figures, the gross operating profits per worker have had an upward trend for the luxury tier across the past five years. Delving into each tier, luxury hotels have the highest gross operating profits per worker. The current analysis coincides with the trends of the revenue per worker.

Profitability Indicator: Average Room Rate across Cities over Five Years

TABLE 199

OVERALL AVERAGE ROOM RATE (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	207	141	158	119	169	160	186
2016	202	136	154	125	178	164	230
2017	197	144	152	116	177	159	226
2018	193	149	145	131	194	154	255
2019	195	132	140	116	179	156	259
Average	199	140	150	121	179	159	231
Growth between 2015 and 2019	-6%	-7%	-12%	-3%	6%	-2%	39%

The average room rate is the measurement of room rates generated by occupied rooms. Singapore and Tokyo have the highest ARR in comparison to other cities. Bangkok has the highest ARR amongst all developing cities, with an average ARR of USD152. Overall, there is a steady increase from 2015 to 2018 followed by a slight dip of 13% between 2018 and 2019. The decrease in ARR between 2018 and 2019 was uniform across all tiers; this may be due to political strife that resulted in a price war to attract customers in the face of dwindling tourist demand.

Average Room Rate by Tier over Five Years (Bangkok)

TABLE 200

AVERAGE ROOM RATE IN BANGKOK (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	239	190	83	37
2016	253	194	83	33
2017	273	194	84	38
2018	281	197	87	42
2019	267	152	85	41
Average	262	185	84	38
Growth between 2015 and 2019	11%	-20%	3%	11%
Secondary Sources	213	123	79	53

Room rates for luxury and upscale are higher than those in mid-tier and budget. This trend has appeared consistently across all cities.

TABLE 201

AVERAGE DAILY RATE 2020 THAILAND HOTEL INDUSTRY SURVEY OF OPERATIONS.[10]

Currency/Year	Under TBH 2,000	TBH 2,000 – 3,000	TBH 3,000 – 5,000	Above THB 5,000
Baht	1,583	2,365	3,685	6,363
USD	53.00	79.18	123.37	213.09

We have also reviewed secondary resources from a hotel consultancy firm (Horwath HTL) to validate our findings. Table 201, Average Daily Rate 2020 Thailand Hotel Industry Survey of Operations, indicates the ADR for the Bangkok region. In the study, hotel tiers are classified based on hotel ADR. Comparing the two datasets, the figures from the Horwath study correspond with our dataset across all tiers, with luxury hotels having the highest ADR and budget hotels having the lowest ADR. Luxury and upscale hotels are slightly lower, which may be due to a higher sample size and a different methodology approach.

Profitability Indicator: Revenue per Available Night (RevPAR) across Cities over Five Years

TABLE 202

OVERALL RevPAR (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	150	125	129	87	129	101	124
2016	149	107	128	90	131	110	141
2017	141	133	123	90	136	110	138
2018	146	122	114	98	165	107	164
2019	149	101	115	87	149	111	138
Average	147	118	122	90	142	108	141
Growth between 2015 and 2019	-1%	-19%	-11%	0%	16%	10%	12%

RevPAR is a profitability ratio used to measure a room's revenue generated from rooms available. Tokyo and Singapore have the highest RevPAR. Similarly, as we compare the two datasets, RevPAR for Bangkok is slightly higher compared to other developing cities.

RevPAR by Tier over Five Years (Bangkok)

TABLE 203

RevPAR IN BANGKOK (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	264	120	72	29
2016	221	118	72	27
2017	303	125	72	27

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[10] This is based on the 2020 Thailand Hotel Industry Survey of Operations conducted by Horwath HTL.

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	Luxury	Upscale	Mid-tier	Budget
2018	250	130	78	32
2019	237	85	75	32
Average	255	116	74	29
Growth between 2015 and 2019	-10%	-29%	4%	10%
Secondary Sources	264	120	72	29

TABLE 204

RevPAR 2020 THAILAND HOTEL INDUSTRY SURVEY OF OPERATIONS.

Currency/Year	Under TBH 2,000	TBH 2,000 – 3,000	TBH 3,000 – 5,000	Above THB 5,000
Baht	1,199	2,183	2,965	5,106
USD	40.14	73.08	99.26	170.94

Comparing ARR and RevPAR, luxury and upscale hotels have the highest averages across all tiers. The current analysis coincides with the ARR above. Cohesive trends for both studies are observed across the two datasets. The RevPAR figures for mid-tier and budget hotels are relatively at par while that for luxury and upscale are slightly higher.

Utilization Indicator: Average Occupancy Rate across Cities over Five Years

TABLE 205

OVERALL AVERAGE OCCUPANCY RATE.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	85%	82%	71%	71%	81%	84%	83%
2016	86%	81%	72%	72%	85%	85%	82%
2017	84%	80%	71%	72%	86%	87%	83%
2018	87%	83%	71%	66%	86%	83%	84%
2019	87%	80%	71%	65%	79%	89%	85%
Average	86%	81%	71%	69%	83%	86%	84%
Growth between 2015 and 2019	2%	-2%	0%	-8%	-2%	6%	2%

The AOR measures the number of rooms occupied divided by the number of rooms available. The average occupancy rate is the highest in Asia's top tourist destinations (Bangkok, Hong Kong, Singapore, and Tokyo). Bangkok is ranked the highest across all cities, standing at an AOR of 87%. It has the highest AOR in comparison to both developing and well-developed cities. In recent years, the Thailand tourism industry has boomed as a result of the government's promotional efforts, growing consumers' appetite for travel as well as affordable traveling options. These factors give rise to a higher AOR for Bangkok compared to other destinations.

TABLE 206

AVERAGE OCCUPANCY RATE IN BANGKOK.

	Luxury	Upscale	Mid-tier	Budget
2015	100%	78%	82%	80%
2016	83%	79%	82%	81%
2017	81%	83%	82%	72%
2018	82%	81%	89%	80%
2019	76%	77%	88%	80%
Average	85%	79%	84%	79%
Growth between 2015 and 2019	-24%	-1%	8%	0%

Across the past five years, hotels in Bangkok have maintained a healthy AOR of 80% or more. Considering each tier, the luxury and mid-tier segments have the highest AOR at 91% and 90%. The current statistics are in line with Singapore's analysis where there is a high AOR among luxury and mid-tier hotels. This is due to two points. First, as Bangkok is a relatively affordable traveling hub, many tourists from neighboring cities such as Hong Kong, Kuala Lumpur, and Singapore benefit from their stronger currencies and can opt for relatively more expensive hotels. Second, mid-tier hotels are one of the most popular options across all tiers because tourists can take advantage of more affordable options and comfortable hotel amenities.

Perception of Productivity

While the definition of productivity is different for each tier, all hotels agree that productivity plays an important role in the industry. The success of productivity has contributed to positive customer satisfaction, high brand recognition, additional revenue generation, additional marketing tools to raise awareness, and exceptional employee performance. Some hotels have even restructured their KPIs or their business plans to incorporate productivity as part of their performance metrics.

Customer satisfaction is instrumental to the success of hotel operations, especially in the luxury tier where hotel managers focus on customer engagement and service quality. Hotels from luxury and upscale tiers have emphasized that human interaction is essential to providing good customer service. Bearing that in mind, productivity is a support tool that maximizes processes effectively and efficiently so employees have more time to serve customers properly. Compared to the mid-tier and budget tiers, improving productivity in the luxury tier signifies the ability to generate new revenues with minimum resource inputs. This is especially true for hotels with high customer volumes. Productivity is also an indicator that can assess the manpower and resources needed to reduce wastage. Budget hotels review the overall manning hours and deploy manpower accordingly across different departments to reduce unnecessary idle time.

Productivity will Follow Once Technology and Process have Proven Success in Other Regions

Productivity in Bangkok is relatively similar to that in Kuala Lumpur and Taipei, where manpower is still at the core of the hotel industry. This can be accredited to competitive labor wages and the availability of human capital, which allow hotels to take advantage of their resources. While productivity is an important factor, hotels across different tiers collectively express the need to ensure quality service.

At the moment, operational processes are still relatively traditional as hotel managers express their reservations about adopting highly technological equipment (only a handful are optimistic about it). The city has reservations about incorporating any ground-breaking technological system, such as robotic cleaning machines or automation, into the hotel industry. Productivity still largely revolves around optimizing labor and manpower deployment.

- As noted above, Bangkok is still undergoing industrial and social transformation. Being a developing country, much of its labor pool still lack educational qualifications. Most of the employees taking up blue-collar jobs are from rural areas and have moved to the city and urban districts in exchange for better job opportunities. Drawing from this, a majority of the frontline staff taking on the front office, housekeeping, or F&B roles may lack the capacity and mindset needed to evolve with the pace of technology. While there may be an inclination to induce new technological gadgets as part of a productivity improvement plan, many managers have high resistance to adapting and learning new skills. Additionally, it may take more time and resources to train a group of employees with low technological competency.

- Some of this reservation stems from the perception that when a technical error occurs, an employee will still have to fix the error made by a robot or the system. This signifies the need to incorporate human capital as the gatekeeper to track and understand potential pitfalls and errors. Many hotel managers perceive that there will be an uptake in such new technologies shortly when hotels across the region witness effective implementation.

- The hotel industry is labor-intensive due to the nature of hospitality, where the human touch is the blueprint of success. Many managers across different hotel tiers have similar reservations about how the adoption of robots or technology may alter or affect their service blueprint. The change in the service blueprint may incur added expenses, resources, and time to educate employees and ensure smooth system integration. This potential risk acts as an inhibitor to Bangkok hotels grabbing a first-mover advantage.

Best Practices Adopted by Hotels

System Integration through Back-end Operations to Support Key Functions

Housekeeping has evolved as hotels incorporate new technological enhancing tools to increase efficiency and productivity through real-time communication. For example, Banyan Tree has spearheaded a zero-waste budgeting initiative to increase housekeeping productivity across all regions. The hotel tracks key statistics such as the time taken to clean a villa or a room, and the number of rooms cleaned per day to understand the efficiency levels of the housekeeping team. To enhance communication, the hotel has incorporated FSC Technology, a solution that provides real-time data on the number of rooms cleaned, the number of rooms left vacant, and the number of rooms needed to clean for the next arriving guest. This tool comes in the form of a mobile phone app that all staff members can download to view real-time updates. This keeps the housekeeping staff aware of the number of rooms left to clean and which rooms are of the highest priority. The introduction of FSC Technology has increased the number of rooms cleaned from an initial number of 10 to 12 per day to 15 to 18 per day.

Partnership and Implementation of Mobile Applications and Technological Tools to Ensure Seamless Operation in F&B

Apart from front office and housekeeping, F&B is a crucial support role that ensures guest satisfaction. The use of technological tools such as Table Queue Management and Crowd

Management has been adopted by many hotels providing dining services. Adopting these tools has allowed F&B managers to understand the traffic flow, peak and non-peak seasons, the amount of manpower required, and the amount of food to purchase in advance. These forecasts allow a for better transition of operations between F&B chefs, purchasing officers, and service crew. Such tools have been adopted by Novotel Suvarnabhumi Airport, JW Marriot, and other hotels providing F&B services. Hotels also leverage mobile phone apps such as Wongnai and Hungryhub for online reservations to attract guests that are not staying in the hotels.

While seamless transition and workflow are crucial in F&B, quality service standards are especially important to luxury hotels. For example, Banyan Tree launched a WOW program that incentivizes service staff to provide a quality guest experience. Guests are asked to rate the service standards provided by the service crew at the end of the meal to understand the quality of F&B. Staff with the highest score are rewarded with holiday stays or vouchers for their hard work.

Impact of COVID-19

The outbreak of COVID-19 forced all Bangkok hotels to remain closed for several months, and the dependency on foreign visitors detrimentally affected hotel revenue. While the hotels changed their strategies to target locals, they are struggling to revamp their revenue cycles because they fear another lockdown that may hinder domestic travel.

In Bangkok, some luxury, upscale, and mid-tier hotels are currently operating as Alternative State Quarantine (ASQ) hotels to sustain revenue. Hotels such as Movenpick BDMS Wellness Resort, The Berkeley Hotel Pratunam, and Holiday Inn Bangkok Sukhumvit have been operating as ASQ hotels for those returning from abroad.

The Bangkok government implemented ASQs to support the domestic economy and drive job creation and growth while the country's borders remain closed. Because tourism is a key sector of the Thai economy, the government's efforts to boost domestic tourism continue in hopes of alleviating the current tourism challenges.

TAIPEI

TABLE 207

INTERVIEW COUNT (TAIPEI).

Count	Overall	Luxury	Upscale	Mid-tier	Budget
Quantitative	20	5	5	5	5
Qualitative	15	4	3	3	5

Hotel Metrics

Efficiency Indicator: Revenue per Worker across Cities over Five Years

TABLE 208

OVERALL ANNUAL REVENUE PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	127,236	65,126	74,027	44,287	87,119	111,061	89,595
2016	128,963	64,640	73,126	45,593	87,412	106,414	94,468
2017	126,869	76,787	75,034	46,467	88,265	99,675	90,674
2018	145,839	81,480	82,080	48,416	84,057	99,987	90,240
2019	170,607	80,930	81,537	59,903	107,687	130,722	111,507
Average	139,903	73,793	77,161	48,933	90,908	109,572	95,297
Growth between 2015 and 2019	34%	24%	10%	35%	24%	18%	24%

The hotel sector of Taipei has revenue per worker similar to that of Bangkok. The numbers of revenue per worker are lower for developing cities when compared with developed cities. While many developed cities face high manpower costs and labor pool shortages, Taipei has the privilege of having excess manpower and low-wage labor. In Taipei, the average labor wage was estimated at USD4.78 in 2019 [15] (Bloomberg Tax, 2019). According to Forbes data from 2018 [16], Taipei experienced lower wages than Hong Kong, Seoul, and Singapore with a take-home pay of USD1,510 per month in 2016. The availability of manpower and lower-cost labor has led to a lower productivity level as hotel managers do not have to worry about manpower and labor constraints.

Moreover, Taiwanese consumers value services and human interaction. As such, with service being the core of the hospitality industry, hotel managers are more inclined to stick with traditional methods to ensure service quality.

TABLE 209

ANNUAL REVENUE PER WORKER IN TAIPEI (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	73,733	94,959	64,898	60,590
2016	75,219	114,266	65,761	53,828
2017	79,696	118,354	63,223	53,998
2018	92,037	78,289	67,040	53,667
2019	88,209	67,174	77,266	64,347
Average	81,779	94,608	67,638	57,286
Growth between 2015 and 2019	20%	-29%	19%	6%

Luxury hotels have the highest revenue per worker at USD83,380, followed by upscale and mid-tier hotels. As seen in the number of employees across each tier, luxury has the highest average number of employees as compared to upscale, mid-tier, and budget hotels as they focus on customer satisfaction and experience. Hence, a higher manning ratio is deployed to ensure higher service quality and more time spent with the customers. The instances of higher revenue per worker in the luxury and upscale segments are due to higher ARR.

Labor Productivity Indicator: Value Add per Worker across Cities over Five Years

TABLE 210

OVERALL ANNUAL VALUE ADD PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	86,383	31,908	47,300	29,691	68,988	91,646	65,053
2016	87,357	34,061	47,555	32,296	70,304	87,340	65,207
2017	88,843	38,583	49,314	30,624	72,295	83,197	62,010
2018	101,230	42,199	55,860	31,899	68,706	82,753	61,696
2019	114,555	38,111	55,370	37,792	86,961	103,824	73,775
Average	95,674	36,972	51,080	32,461	73,451	89,752	65,548
Growth between 2015 and 2019	33%	19%	17%	27%	26%	13%	13%

In terms of value-add per worker, Taipei saw an average of USD51,080 from 2015 to 2019, slightly higher than Bangkok and Kuala Lumpur. This may be due to higher productivity levels across the country.

Value Add per Worker by Tier over Five Years (Taipei)

TABLE 211

ANNUAL VALUE ADD PER WORKER IN TAIPEI (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	48,318	45,149	44,278	22,126
2016	49,099	60,018	45,953	24,028
2017	51,901	68,203	44,178	24,189

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	Luxury	Upscale	Mid-tier	Budget
2018	62,732	45,014	47,395	23,561
2019	59,988	37,156	55,026	31,618
Average	54,407	51,108	47,366	25,104
Growth between 2015 and 2019	24%	-18%	24%	43%

Value-add per worker is an important measurement of determining labor productivity. Frost & Sullivan notes that the number reaches the highest in luxury, upscale, and mid-tier hotels. In contrast, budget hotels have much lower value-add per worker as many of them report their low levels of technology adoption.

Profitability Indicator: Gross Operating Profit per Worker across Cities over Five Years

TABLE 212

OVERALL ANNUAL GROSS OPERATING PROFIT PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	54,683	32,865	26,842	28,735	75,197	69,297	55,102
2016	55,558	33,870	24,872	31,806	67,310	66,899	55,963
2017	57,888	37,464	26,069	30,461	68,655	65,001	56,293
2018	57,888	41,175	32,018	32,770	65,645	69,322	53,075
2019	66,816	38,827	32,084	39,372	90,316	84,729	66,175
Average	82,995	36,840	28,176	32,359	72,669	70,494	57,073
Growth between 2015 and 2019	22%	18%	20%	37%	20%	22%	20%

Gross operating profit per worker measures the profitability generated by each worker. A similar trend of high profitability is seen among the well-developed cities of Hong Kong, Singapore, and Tokyo. Lower gross operating profit per worker is seen more in developing cities than in developed ones, indicating slower productivity.

Hotel managers expressed the opinion that consumers are still not receptive to new technological gadgets. Self-service kiosk technology is nascent in Taipei as consumers prefer face-to-face interaction and service. Motivation to implement self-service kiosks is relatively low as consumers are unfamiliar with these technologies. Furthermore, managers do not see the benefit of having self-service kiosks as employees will still be assigned to assist customers with the machines. Technology is perceived to create new job functions without eliminating tasks because employees will have to be skilled in operating self-service kiosks to best support customers' inquiries about using them. Technological tools such as robotic cleaning machines are costly; it is cheaper to invest in manpower than in robotic cleaning machines. These reasons hinder motivation to increase the adoption of or investment in new technologies, resulting in lower technology adoption rates.

Gross Operating Profit per Worker by Tier over Five Years (Taipei)

TABLE 213

ANNUAL GROSS OPERATING PROFIT PER WORKER IN TAIPEI (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	27,036	45,006	15,968	22,126
2016	26,536	43,053	17,657	24,028
2017	27,927	42,033	18,439	24,189
2018	37,605	28,345	20,831	23,561
2019	36,621	27,712	24,882	31,618
Average	31,145	37,230	19,555	25,104
Growth between 2015 and 2019	35%	-38%	56%	43%

Profitability is slightly higher for luxury and upscale hotels in comparison to mid-tier and budget hotels. This may be due to standardized operations that help streamline processes and reduce costs or idle resources. Profitability is higher in the luxury and upscale tiers because they emphasize service quality, which is the core of their performance metrics. Unlike other cities where mid-tier hotels tend to have higher productivity, a much lower gross operating profit per worker is seen in Taipei, which has a higher proportion of domestic hotels in this segment. This is based on the hypothesis that domestic hotels are less productive than international brands.[11]

Higher Profitability and Productivity in Luxury and Upscale Segments due to Premium Prices and Standardized Operations

Although all hotel tiers emphasize service quality, luxury hotels regard it as the core of their performance metrics. Luxury and upscale hotels focus on providing customer satisfaction and quality service in exchange for selling rooms at premium prices. As such, the business strategies adopted across the four tiers differ according to their business proposition. Bearing that in mind, luxury and upscale hotels report that the incorporation of technological tools (such as self-service kiosks) at the front office may hinder overall customer satisfaction due to less customer interaction. In this case, it is more prevalent to adopt back-end technologies like Oracle, PMS, and other forecasting tools to streamline and standardize global operations across luxury, upscale, and mid-tier hotels and increase overall productivity. These back-end technologies help reduce potential human error, forecast the number of incoming guests, calculate hotel rates based on supply and demand, and forecast manpower needs in advance based on incoming guest traffic.

Budget hotels may implement some basic technological tools and systems or digitalize their operations by working with online travel agencies to gain more customers and increase hotel brand awareness. While there is resistance to adopting these technologies, a small minority of hotels like the Golden Garden Hotel have implemented self-service check-in kiosks to reduce check-in waiting times. However, budget hotels face low adoption rates. Despite hotels implementing self-service kiosks, many customers still prefer face-to-face interactions with the hotel staff during check-in. Additionally, the incorporation of self-service kiosks does not result in less manpower because

[11] The project specification limits the ability of Frost & Sullivan to prove the following statement unless more data is collected.

service staff continues to be responsible for supporting customers by operating the self-service kiosks to ease the check-in process. Managers also remain skeptical about other forms of technology, such as robotic cleaning machines, as they believe that humans deliver more attention to detail when it comes to cleanliness.

Large Franchise Hotels will be the First to Adopt Productivity Changes in Taipei

Frost & Sullivan notes that while productivity is lower in Taipei, large franchise hotels will pioneer these changes to streamline global operations. Hotels in the budget and mid-tier markets have less inclination to pioneer the implementation of new strategies or technological devices due to the potential risk involved. They are more likely to take the follower approach by observing trends or strategies implemented by their peers and competitors from the luxury or upscale segments before deciding to adopt new approaches. In addition, luxury and upscale hotels are likely to have the right resource and talent pool for implementing innovative strategies and new technologies. Hence, productivity advancement in Taipei will depend on international brands introducing these changes.

Large international hotel chains such as Marriot and Hilton have their mobile phone apps targeted toward their members to increase customer retention rates, understand customer demographics, and predict customer behaviors. Mobile apps allow customers to experience personalized rewards such as express check-out, mobile room keys, and digital check-in. While these present opportunities for digitalized processes, these applications are only applicable to members. This limitation is deterrence in streamlining different applications and opening such processes to other customer groups.

Efficiency Indicator: Operating Cost per Worker across Cities over Five Years

TABLE 214

OVERALL ANNUAL OPERATING COST PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40,854	33,218	26,727	14,596	18,131	19,415	24,542
2016	41,607	30,579	25,570	13,297	17,108	19,074	29,261
2017	38,026	38,204	25,720	15,843	15,970	16,478	28,665
2018	44,609	39,281	26,220	16,517	15,351	17,234	28,545
2019	56,051	42,819	26,167	22,111	20,726	26,898	37,731
Average	44,229	36,820	26,081	16,473	17,457	19,820	29,749
Growth between 2015 and 2019	37%	29%	-2%	51%	14%	39%	54%

The efficiency ratio of operating cost per worker measures the expense per employee. It is noted that Taipei has a low operating cost per worker at an average of USD26,081. The lower operating cost may be due to lower purchasing parity and a weaker currency.

Operating Cost per Worker by Tier over Five Years (Taipei)

TABLE 215

ANNUAL OPERATING COST PER WORKER IN TAIPEI (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	25,415	49,810	20,620	30,679
2016	26,120	54,248	19,808	23,806
2017	27,795	50,150	19,045	23,815
2018	29,306	33,276	19,645	24,042
2019	28,221	30,018	22,240	26,140
Average	27,371	43,500	20,272	25,696
Growth between 2015 and 2019	11%	-40%	8%	-15%

Annual operating cost per worker is the highest in the upscale segment, indicating that more expenses and resources are invested in an upscale hotel's day-to-day operations. The higher operating cost for upscale hotels may be due to the small staff sizes as compared to luxury and mid-tier hotels. Budget hotels have the lowest annual operating cost per worker; this may be due to their smaller operational size. Most budget hotels have relatively low operating costs due to their size.

Profitability Indicator: Average Room Rate across Cities over Five Years

TABLE 216

OVERALL AVERAGE ROOM RATE (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	207	141	158	119	169	160	186
2016	202	136	154	125	178	164	230
2017	197	144	152	116	177	159	226
2018	193	149	145	131	194	154	255
2019	195	132	140	116	179	156	259
Average	199	140	150	121	179	159	231
Growth between 2015 and 2019	-6%	-7%	-12%	-3%	6%	-2%	39%

Looking at all cities, Singapore and Tokyo have the highest ARR. However, it is relatively higher in Taipei than in other developing cities.

Average Room Rate by Tier over Five Years (Taipei)

TABLE 217

AVERAGE ROOM RATE IN TAIPEI (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	228	178	139	53
2016	224	169	137	53
2017	220	173	131	53
2018	209	170	129	57
2019	199	169	121	57
Average	216	172	131	55
Growth between 2015 and 2019	-13%	-5%	-12%	9%

In Taipei, ARR is highest in the luxury segment, followed by upscale, mid-tier, and budget hotels. The increasing ARR across tiers reflects that luxury and upscale hotels provide better services and facilities in exchange for a premium price, as explained above.

Profitability Indicator: Revenue per Available Night (RevPAR) across Cities over Five Years

TABLE 218

OVERALL RevPAR (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	150	125	129	87	129	101	124
2016	149	107	128	90	131	110	141
2017	141	133	123	90	136	110	138
2018	146	122	114	98	165	107	164
2019	149	101	115	87	149	111	138
Average	147	118	122	90	142	108	141
Growth between 2015 and 2019	-1%	-19%	-11%	0%	16%	10%	12%

Across all cities, Singapore and Tokyo have the highest RevPAR whereas Taipei has a relatively moderate RevPAR.

RevPAR by Tier over Five Years (Taipei)

TABLE 219

RevPAR IN TAIPEI (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	194	154	90	46
2016	186	169	94	46
2017	185	169	94	46

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	Luxury	Upscale	Mid-tier	Budget
2018	170	153	84	47
2019	166	155	84	53
Average	180	160	89	48
Growth between 2015 and 2019	-14%	1%	-7%	15%

RevPAR in Taipei corresponds to Frost & Sullivan's ARR analysis, with luxury and upscale hotels having significantly higher RevPAR than the other tiers.

Utilization Indicator: Average Occupancy Rate across Cities over Five Years

TABLE 220

OVERALL AVERAGE OCCUPANCY RATE.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	85%	82%	71%	71%	81%	84%	83%
2016	86%	81%	72%	72%	85%	85%	82%
2017	84%	80%	71%	72%	86%	87%	83%
2018	87%	83%	71%	66%	86%	83%	84%
2019	87%	80%	71%	65%	79%	89%	85%
Average	86%	81%	71%	69%	83%	86%	84%
Growth between 2015 and 2019	2%	-2%	0%	-8%	-2%	6%	2%

Looking across all cities, Taipei has a relatively low AOR though it is one of the top destination hubs in Asia. Taipei's core tourist group is Chinese, largely from China, Hong Kong, and Singapore. However, the tourism industry in Taipei has detracted, particularly in 2017 due to Taiwan's disposition with China, which created more political tension. The rule of the Democratic Progressive Party in 2016 [17] has resulted in a travel ban between the two countries, leading to a slight decline in tourism from 2016 to 2018 (see Table 221, Number of Inbound Tourists in Taiwan) [18]. The tourism industry has seen moderate growth in visitor arrivals from 2015 to 2019, with continual year-on-year growth from 2015 to 2018, followed by declining growth in 2019 due to political tensions with China.

As Mainland China accounts for the bulk of Taiwan's tourist arrivals, rising instability and political rivalry between the countries have led to a drastic decline in tourist arrivals from China. Most recently, the ban on solo travel to Taiwan imposed by the Chinese government also caused a decline in Chinese arrivals into the country, accounting for a consistent decline in AOR from 2017 to 2019.

TABLE 221

NUMBER OF INBOUND TOURISTS IN TAIWAN.

	2015	2016	2017	2018	2019
Taiwan	10,690,279	10,739,601	11,066,707	11,864,105	11,860,000

TABLE 222

AVERAGE OCCUPANCY RATE IN TAIPEI.

	Luxury	Upscale	Mid-tier	Budget
2015	100%	71%	59%	67%
2016	77%	77%	62%	72%
2017	76%	76%	61%	74%
2018	76%	79%	60%	74%
2019	77%	61%	64%	75%
Average	81%	73%	61%	72%
Growth between 2015 and 2019	-23%	-14%	9%	12%

AOR trends in Taipei are relatively similar to those in Bangkok and Singapore. The luxury tier has the highest AOR in Taipei. This may be a result of its guests having the highest purchasing power and their growing appetite for luxury and quality service. Furthermore, Taipei has a lower ARR average in the luxury hotel tier of USD216 as compared to Singapore (USD279) and Bangkok (USD262). As such, the lower hotel room rates may attribute to the higher AOR within the luxury tier.

Upscale and mid-tier hotels have a lower AOR of 73% and 61%, respectively. Interestingly, the budget hotel tier has a high AOR of 85%. Despite consumers' growing purchasing power, budget hotels are still popular amongst backpacker tourists with lower purchasing power. An additional point worth noting is that most of these budget hotels operate on a small scale, with an average of 60 rooms. Hence, it is easier to achieve a high occupancy rate as compared to upscale and mid-tier hotels that operate at higher customer volumes.

Perception of Productivity

Productivity is a subset of customer satisfaction. With customer satisfaction being the key performance indicator, high productivity facilitates a better customer experience during their stay in the hotel. Improving productivity means eliminating tasks that are repetitive and laborious, reducing the number of workers per shift, and decreasing the risk of human error by deploying machines and integrating systems. The improvement of each factor frees hotels to reallocate manpower to support other roles, and any extra time made available can be redirected to customer service or front office assistance during peak periods.

Productivity at a hotel is the correlation between input and output to ensure that resources are allocated efficiently across each function toward achieving the hotel's goals. In one of the qualitative interviews, the respondent defined productivity as "creating the maximum customer satisfaction with minimum resources." Many hotel managers perceive productivity as the strategic allocation of resources to the needed functions.

Best Practices Adopted by Hotels

Across the board, luxury and upscale hotels with an international presence are the most likely to integrate new technologies that will help standardize systems and ensure brand alignment. Tools such as Opera, property management systems, CRM systems, and iPad check-in platforms are commonly implemented across international franchise hotels.

Traditionally, the processes of hotel booking and record keeping are performed manually using Excel spreadsheets and paper documents, especially in small-scale and budget hotels. Paper-based check-in tools are sometimes still used in the check-in process. However, with the rapid pace of technological development, budget hotels are moving towards digitalization and working with online travel agencies to remain relevant and competitive. A hotel's lack of technological tools may be perceived as being backward and outdated.

In particular, Aloft Hotel, a brand under the Marriot Group, has implemented mobile phone-based keys to replace physical room cards. The Mobile Key is part of the Marriot Bonvoy application, which targets the company's members, allowing them to check into their rooms and facilities without having to interact with the front office. Mobile Key eliminates the check-in and check-out processes, freeing up FO staff to attend to other customers who require assistance.

While the Mobile Key is an attempt to streamline global operational processes and improve productivity, its global adoption rate is only 8%. Customers also face an issue: the Mobile Key is only applicable to one mobile device, regardless of the number of people staying in the same room.

The Hilton Group has also piloted express check-out as a method to improve productivity. Instead of heading to the front office to check out, customers can deposit their key cards in a designated return box with pre-authorized credit card access. In addition, to reduce the number of dissatisfied customers, the hotel has implemented Table-check, a table reservation system that allows staff to view real-time information on the number of unused seats, decreasing their waiting time and thereby increasing customer satisfaction.

In the budget tier, Golden Garden Hotel has implemented a self-check-in machine to speed up productivity during peak hours. Initially, adoption of this machine was only 5%, and although hotel staff was assigned to assist guests who operated the self-service kiosk, customers still preferred the traditional mode of check-in. Most budget hotels could be perceived as old and outdated; some of them are still using traditional check-in and check-out methods such as paper-based logs or keying in Excel sheets to record the entry and exit of customers. The adoption of technological tools is sometimes intended to impress the customers that the hotel is relevant and modern.

Impact of COVID-19

Streamlining Job Roles and Functions to Enhance Productivity

Apart from technology adoption, hotel managers are slowly transitioning to cross-functional deployment in light of COVID-19 to maintain and minimize operating costs. Traditionally, hotels in Taipei have had the luxury to deploy staff to designated or specialized functions; however, cross-deployment has recently become a need to reduce operational costs. Hotels are taking a new approach by cross-deploying and upskilling employees for re-assignment into different functions as a way to mitigate the shortage of manpower and streamline the operational process, to achieve

enhanced efficiency. While there is an adequate labor pool in the market, housekeeping departments experience a shortage of manpower as these roles are laborious, intuitive, and low-paying. Additionally, hotel chains tend to place strict requirements on housekeeping staff to ensure adherence to their branding and reputation. In light of these factors, various luxury and upscale hotels outsource housekeeping to external vendors and allocate their resources and time to other jobs that require higher-level skill sets.

Cross-functioning and Upskilling Employees

As noted above, hotels have traditionally assigned employees to designated job functions that focus on one area. However, COVID-19 forced many hotels to streamline job roles through upskilling and redeploying employees to fulfill more tasks. Job structures have become more fluid with the cross-functioning of tasks, under which hotel staff is expected to support job roles outside of their main responsibilities during peak periods to ensure that hotels can operate optimally with the minimum amount of manpower.

A front office employee may now have to support housekeeping to speed up the cleaning process and prepare rooms for incoming guests. Some hotels in the luxury and upscale tiers conduct employee training programs to impart transferable skills and support cross-deployment across departments. While the pandemic has hammered the hotel industry, it has spurred many hotels to improve their overall productivity by streamlining job functions and keeping manpower expenses low. Upskilling of employees gives hotels deployment flexibility and thus improves productivity.

Streamlining Operational Processes through Redesigning Service Blueprint

Frost & Sullivan notes that in regards to the analysis of productivity across time, hotel managers in Taipei were more conservative in the pre-COVID era, with their focus mainly on financial performance and operating income. However, with job rotation and the influx of foreign talent, hotel managers have garnered a new perspective to break free from the traditional mindset and implement new strategies that align with their experience and exposure. Regionally, COVID-19 has expedited hotel leaders' willingness to think outside of the box to effectively address the ongoing lack of revenue from foreign tourists and MICE business, as well as to face the manpower crunch. Business models have shifted their focus from financial performance to productivity and efficiency.

Aside from digitalization and technology adoption initiatives, hotels are adjusting their business models and processes to eradicate job functions or positions that can be replaced by systems (e.g., Oracle and property management systems) and establish new positions that merge functions and require less manpower. In particular, Hilton Group has spearheaded the Operation Efficiency Model to transform and redesign the service blueprint; it has eliminated roles that can be easily replicated and digitized processes through its cloud system. This model aims to reduce inefficiencies and human error. Depending on the city, Hilton Hotel has a distinct strategy that considers the nation's cultures and macro-environment. In Taipei, the Operation Efficiency Model is taught to hotel managers as a corporate lesson to increase productivity among all hotel employees. Cross-functional deployment at this hotel has been deployed more frequently during the COVID-19 pandemic.

Change of Perspective after COVID-19

COVID-19 has transformed the hotel industry tremendously, forcing hotel managers to redesign job roles and operational processes. Even though Taipei has not been affected heavily by the

pandemic, the closure of borders has impacted hotel businesses and livelihoods. Hotel managers are recalibrating their profitability and productivity models to ensure business sustainability and continuity in the long run. With the lack of foreign tourists and MICE business, hotel managers are maximizing opportunities from domestic travel by offering competitive prices and increasing F&B services and other revenue streams.

Cross-functional deployment and job rotation have blurred job roles and tasks amongst employees who are now expected to take on more responsibilities. Expectations have changed and new roles may emerge, so employees must be prepared to support multiple roles.

KUALA LUMPUR

TABLE 223

INTERVIEW COUNT (KUALA LUMPUR).

Count	Overall	Luxury	Upscale	Mid-tier	Budget
Quantitative	20	5	5	5	5
Qualitative	12	1	4	5	2

Hotel Metrics

Efficiency Indicator: Revenue per Worker across Cities over Five Years

TABLE 224

OVERALL ANNUAL REVENUE PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	127,236	65,126	74,027	44,287	87,119	111,061	89,595
2016	128,963	64,640	73,126	45,593	87,412	106,414	94,468
2017	126,869	76,787	75,034	46,467	88,265	99,675	90,674
2018	145,839	81,480	82,080	48,416	84,057	99,987	90,240
2019	170,607	80,930	81,537	59,903	107,687	130,722	111,507
Average	139,903	73,793	77,161	48,933	90,908	109,572	95,297
Growth between 2015 and 2019	34%	24%	10%	35%	24%	18%	24%

Revenue per Worker by Tier over Five Years (Kuala Lumpur)

TABLE 225

ANNUAL REVENUE PER WORKER IN KUALA LUMPUR (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	34,919	53,352	53,159	29,571
2016	33,527	61,260	55,591	29,570
2017	35,583	53,467	59,302	30,185
2018	36,196	65,341	57,844	31,878
2019	48,313	92,587	72,961	28,972
Average	37,708	65,201	59,771	30,035
Growth between 2015 and 2019	38%	74%	37%	-2%

The revenue per worker serves as an indicator of the revenue generated by the average employee, and, in turn, helps determine the productivity of employees as an indicator of the output (revenue) generated. Table 224, Overall Annual Revenue per Worker (in USD), shows that Kuala Lumpur ranks last amongst all cities surveyed during the four years, indicating the city's low hotel employee efficiency trend. Further, from 2015 to 2018, the revenue per worker increased by 18.6% but then declined, netting a moderate increase of 14.8% overall from 2015 to 2019. The low revenue per worker could be due to the low volume of tourist visits, as detailed below. Upscale and mid-tier hotels see the highest profitability due to their higher utilization and occupancy rates.

Kuala Lumpur's Hotel Industry Dynamics from 2015 to 2019

During the study time frame, the city experienced rather moderate growth in tourist arrivals. The hotel industry, however, has seen an uptick in supply, buoyed by the entry of international brands. As supply outpaces demand, pressure has increased on local, independent hotel operators whose customer base is at risk of dilution.

In addition, according to Statista (2020) [19], the ASEAN countries, China and India comprise the largest source group of inbound tourists. Often, countries with lower purchasing parity power tend to be more price-sensitive toward hotel room rates. As such, tourist demographics may hinder overall industry revenue as tourists in Kuala Lumpur tend to prefer mid-tier or budget hotels.

The city has seen growing popularity amongst Chinese and Indian travelers, helped largely by the expansion of its E-Visa program that issues on-arrival visas to residents from these countries to ease access. However, political instability and a financial scandal have dampened tourist perceptions of the city and affected the business environment, making the city less favorable for both business and tourism growth. While the volume of foreign tourist arrivals is higher in Kuala Lumpur as compared to other cities, the overall tourist profiles and demographics influence their choice of hotel stay.

These unique challenges have resulted in lower productivity and profitability for hotels. Priorities tied to productivity are low as the majority of hotel operators in the city still use traditional operational processes. In Frost & Sullivan's interview with hotel managers, the Malaysian experience with technology in the hotel industry has been characterized as limited, with a manager of Holiday Inn stating that in his experience in Singapore and Kuala Lumpur, the rate of technology adoption in Malaysia lags behind that of other cities. In addition, manpower availability also slows down the need to focus on productivity across the hotel tiers.

Labor Productivity Indicator: Value Add per Worker across Cities over Five Years

TABLE 226

OVERALL ANNUAL VALUE ADD PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	86,383	31,908	47,300	29,691	68,988	91,646	65,053
2016	87,357	34,061	47,555	32,296	70,304	87,340	65,207
2017	88,843	38,583	49,314	30,624	72,295	83,197	62,010
2018	101,230	42,199	55,860	31,899	68,706	82,753	61,696

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	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2019	114,555	38,111	55,370	37,792	86,961	103,824	73,775
Average	95,674	36,972	51,080	32,461	73,451	89,752	65,548
Growth between 2015 and 2019	33%	19%	17%	27%	26%	13%	13%

Value Add per Worker by Tier over Five Years (Kuala Lumpur)

TABLE 227

ANNUAL VALUE ADD PER WORKER IN KUALA LUMPUR (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	24,908	31,486	31,754	34,374
2016	22,605	40,649	40,837	34,377
2017	25,181	31,969	34,110	34,576
2018	26,433	36,534	32,524	36,890
2019	31,940	53,724	41,578	33,068
Average	26,214	38,872	36,161	34,657
Growth between 2015 and 2019	28%	71%	31%	-4%

Similar trends are seen in terms of revenue per worker and value-add per worker, with Kuala Lumpur recording the lowest average among all cities reviewed as part of this study. Value added per worker increased from 2015 to 2018 before a decrease of 9% from 2018 to 2019. Trends here correlate with those of revenue per worker, indicating lower productivity in Kuala Lumpur. This trend is elaborated upon below. By comparison, value-add per worker in Kuala Lumpur has the lowest average among all cities.

Abundance of Manpower Reduces Motivation to Pursue Productivity

Manpower scarcity drives productivity in most cities, where low available labor forces hotels to seek efficiencies to ensure long-term capital input reduction. Like Bangkok and Taipei, Kuala Lumpur has the rare standing of a readily available supply of abundantly cheap domestic labor. Hence, hotels have the flexibility to readily increase and decrease manpower when the needs arise. Since vacancies are easily filled at a low cost, hotels have little initiative to embark on productivity measures as investment costs are much higher than the costs of hiring more manpower. This scenario is echoed in the developing cities of Bangkok and Taipei, where the abundant availability of cheap labor has led to low investment in technology as the solution to boost productivity.

Investments in technology have high initial costs, with returns on investment that are realized over long periods. Lower labor costs have created a low-pressure environment for hotel managers who state that productivity gaps can just as easily be cheaply met in the short term with increased labor. Hence, as productivity gaps are plugged in the short term with more hires, hotel managers shy away from productivity-related investments as unnecessarily capital-intensive. This sentiment is

echoed by Holiday Inn, whose manager stated that technologies such as RFID are expensive when contrasted with manpower resources that can be employed in similar functions. Hence, hotels have little incentive or motivation to embark on technology adoption.

Profitability Indicator: Gross Operating Profit per Worker across Cities over Five Years

TABLE 228

OVERALL ANNUAL GROSS OPERATING PROFIT PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	54,683	32,865	26,842	28,735	75,197	69,297	55,102
2016	55,558	33,870	24,872	31,806	67,310	66,899	55,963
2017	57,888	37,464	26,069	30,461	68,655	65,001	56,293
2018	57,888	41,175	32,018	32,770	65,645	69,322	53,075
2019	66,816	38,827	32,084	39,372	90,316	84,729	66,175
Average	82,995	36,840	28,176	32,359	72,669	70,494	57,073
Growth between 2015 and 2019	22%	18%	20%	37%	20%	22%	20%

Gross Operating Profit per Worker by Tier over Five Years (Kuala Lumpur)

TABLE 229

ANNUAL GROSS OPERATING PROFIT PER WORKER IN KUALA LUMPUR (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	25,355	25,541	24,755	34,374
2016	23,059	34,603	36,353	34,377
2017	26,183	26,157	30,182	34,576
2018	26,319	27,580	33,328	36,890
2019	32,214	42,626	44,831	33,068
Average	26,626	31,302	33,890	34,657
Growth between 2015 and 2019	27%	67%	81%	-4%

Gross operating profit per worker is measured as the profit generated by each worker. Kuala Lumpur ranks behind the other cities in this study; however, gross operating profit per worker is relatively in line with the developing cities. By tier, the gross operating profit per worker improvement is seen in all levels except for budget hotels, which experienced a slight drop of 4%. Across all tiers, upscale and mid-tier hotels display the highest profitability level.

Reliance on Short-term Employment Contracts

A spin-off effect of the abundant availability of cheap labor in Kuala Lumpur is the high reliance on short-term employment contracts amongst hotels in the city. Short-term employment is

regarded as a key business practice that has allowed hotels to dynamically respond to changes in operational demand and seasonal customer numbers. When productivity gaps arise and seasonal customer arrivals increase, hotels can create short-term employment positions to meet their business needs. Moreover, when business needs decrease, short-term employment contracts will have already expired. Hotels such as Westlink have relied on students as short-term hires to meet business needs.

However, this practice has limited success. Westlink Hotel states that it needs to reconsider this practice because of the impact the high turnover rate has on business operations. The hotel's reliance on students as short-term hires creates a high turnover rate, with employees leaving the hotel once their terms of employment end. The hotel has to train subsequent new hires who are called upon when needs arise. Hence, the time and other resources dedicated to training short-term hires are duplicated. Moreover, in an already capital-scarce environment, more capital is dedicated to the continual hiring and training of new employees. Thus, frequent departures affect hotel productivity, with staff being called upon to help cover the work gaps. Therefore, as expressed by Westlink Hotel, a need remains to shift focus to training permanent hires and away from reliance on short-term employment contracts to boost long-term productivity.

In essence, lower productivity readiness in Kuala Lumpur is seen across all indicators. Aside from an adequate manpower pool, the lack of a skilled labor force and lower productivity integration in the budget segment has contributed to slow productivity growth in Kuala Lumpur.

Manpower Profile, an Important Barrier to Technology Adoption

Further, the skills and competencies of available labor in the hotel industry present an important challenge to technology adoption in Kuala Lumpur. Hotel managers repeatedly stress that available workers are often low-skilled, with low technology-related competencies. The lower education levels among workers as compared to other cities surveyed means that more resources must be dedicated to training and upskilling hotel staff in preparation for technology adoption. This is a particularly common challenge amongst budget and mid-tier hotels, which have limited resources to expend on these initiatives. Therefore, aside from cost and resource considerations, workforce readiness is a critical barrier to adopting technologies.

Short Lease Agreements Make Long-term Investment in Technology Unfeasible

In the budget tier, many hotels have entered short lease agreements of about five years. This is particularly important for budget hotels, with already limited cash reserves. With investments in technology often requiring a period to see returns, hotels with shorter leases face more uncertainty about realizing returns before their lease period ends, making long-term investments unfeasible. Thus, this has been a considerable inhibitor preventing budget hotels from embarking on technology-related transformation.

The availability of a low-cost, short-term labor pool reduces the need to drive productivity growth. In addition, gross operating profit per worker as seen in Table 227, Annual Gross Operating Profit per Worker (Overall), is vastly lower as compared to the other cities. Low profitability, as reflected by revenue per worker, as well as low productivity as explained in this section, may indicate poor industry growth in Kuala Lumpur. However, these indicators may be skewed to the lower end as there is a higher proportion of mid-tier and budget hotels.

Efficiency Indicator: Operating Cost per Worker across Cities over Five Years

TABLE 230

OVERALL ANNUAL OPERATING COST PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40,854	33,218	26,727	14,596	18,131	19,415	24,542
2016	41,607	30,579	25,570	13,297	17,108	19,074	29,261
2017	38,026	38,204	25,720	15,843	15,970	16,478	28,665
2018	44,609	39,281	26,220	16,517	15,351	17,234	28,545
2019	56,051	42,819	26,167	22,111	20,726	26,898	37,731
Average	44,229	36,820	26,081	16,473	17,457	19,820	29,749
Growth between 2015 and 2019	37%	29%	-2%	51%	14%	39%	54%

Operating Cost per Worker by Tier over Five Years (Kuala Lumpur)

TABLE 231

ANNUAL OPERATING COST PER WORKER IN KUALA LUMPUR (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	10,011	21,866	21,405	2,698
2016	10,922	20,612	14,754	2,676
2017	10,403	21,497	25,191	2,975
2018	9,763	28,807	25,320	2,945
2019	16,373	38,862	31,383	2,935
Average	11,494	26,329	23,611	2,846
Growth between 2015 and 2019	64%	78%	47%	9%

Among all seven cities, Kuala Lumpur has the lowest operating cost per worker. This result coincides with the findings in our qualitative analysis as hotels rely largely on cheap and accessible manual labor to keep costs down. As seen in Efficiency Indicator: Revenue per Worker across Cities over Five Years, revenue per worker is the lowest in Kuala Lumpur. As such, hotels may have to lower overall expenses to ensure the profitability of business operations. Across all tiers, operating costs have increased, with luxury and upscale hotels indicating the highest change. While it is noted that Kuala Lumpur has low to moderate technological implementations across all seven cities, hotels in Kuala Lumpur are collectively implementing technological tools to streamline tasks and align with overall international hotel operation standards.

Profitability Indicator: Average Room Rate across Cities over Five Years

TABLE 232

OVERALL AVERAGE ROOM RATE (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	207	141	158	119	169	160	186
2016	202	136	154	125	178	164	230
2017	197	144	152	116	177	159	226
2018	193	149	145	131	194	154	255
2019	195	132	140	116	179	156	259
Average	199	140	150	121	179	159	231
Growth between 2015 and 2019	-6%	-7%	-12%	-3%	6%	-2%	39%

The average room rate in Kuala Lumpur remains the lowest among all cities in the study. The sample count is largely concentrated in the budget and mid-tier segments, which explains the lower skew of average room rates in comparison to other cities. In addition, hotel managers state that customers in Kuala Lumpur tend to come from China, India, and other neighboring Asian countries [19], and they are very price sensitive. This factor contributes to the pressure hotels face to keep prices down to remain competitive. The lower ARR may also contribute to the lower revenue per worker. The lower ARR is directly linked to the overall lower revenue generation in the hotel industry.

Average Room Rate by Tier over Five Years (Kuala Lumpur)

TABLE 233

AVERAGE ROOM RATE IN KUALA LUMPUR (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	189	188	109	19
2016	234	199	91	19
2017	205	186	91	19
2018	264	215	93	19
2019	194	175	94	19
Average	217	193	96	19
Growth between 2015 and 2019	3%	-7%	-13%	0%

Kuala Lumpur has the lowest ARR across all cities due to a weakening currency and political instability. Further, budget hotels hold the lowest ARR across all cities. Across all four tiers, the upscale and mid-tier markets experienced a decline of 7% and 13% respectively, while luxury hotels see an increase of 3% from 2015 to 2019.

Profitability Indicator: Revenue per Available Night (RevPAR) across Cities over Five Years

TABLE 234

OVERALL RevPAR (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	150	125	129	87	129	101	124
2016	149	107	128	90	131	110	141
2017	141	133	123	90	136	110	138
2018	146	122	114	98	165	107	164
2019	149	101	115	87	149	111	138
Average	147	118	122	90	142	108	141
Growth between 2015 and 2019	-1%	-19%	-11%	0%	16%	10%	12%

TABLE 235

RevPAR IN KUALA LUMPUR (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	137	158	68	12
2016	164	174	52	12
2017	156	173	52	18
2018	193	185	54	12
2019	142	196	54	12
Average	158	178	56	13
Growth between 2015 and 2019	4%	24%	-19%	-3%

Kuala Lumpur emerges with the lowest RevPAR in comparison to the other cities. Amongst all tiers, upscale has the highest RevPAR due to higher occupancy rates, which results in its higher RevPAR than that of luxury.

Utilization Indicator: Average Occupancy Rate across Cities over Five Years

TABLE 236

OVERALL AVERAGE OCCUPANCY RATE.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	85%	82%	71%	71%	81%	84%	83%
2016	86%	81%	72%	72%	85%	85%	82%
2017	84%	80%	71%	72%	86%	87%	83%
2018	87%	83%	71%	66%	86%	83%	84%
2019	87%	80%	71%	65%	79%	89%	85%

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	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
Average	86%	81%	71%	69%	83%	86%	84%
Growth between 2015 and 2019	2%	-2%	0%	-8%	-2%	6%	2%

Average Occupancy Rate by Tier over Five Years (Kuala Lumpur)

TABLE 237

AVERAGE OCCUPANCY RATE IN KUALA LUMPUR.

	Luxury	Upscale	Mid-tier	Budget
2015	100%	95%	63%	59%
2016	72%	95%	64%	59%
2017	71%	94%	64%	59%
2018	75%	57%	64%	59%
2019	73%	58%	64%	58%
Average	78%	80%	64%	59%
Growth between 2015 and 2019	-27%	-39%	2%	-2%

Across all cities, Kuala Lumpur has one of the lowest AORs, which witnessed a 15% decrease from 2017 to 2018 due to political instability that slowed tourism. As reported above, upscale hotels see a higher RevPAR than luxury hotels due to higher AOR.

Perception of Productivity

Unlike many of the other cities studied, the perception of productivity in Kuala Lumpur is lower among hotel management. In general, participating managers believe that tracking labor input efficiencies is sufficient when tracking productivity. With increasing competition amongst hotel operators vying for a limited number of guests, the immense cost pressure has made new investments in productivity initiatives a distant priority. Hence, the reduced availability of capital has meant that productivity has largely been reduced to a time-saving and cost-cutting initiative, with many hotels unable to embark on investments or concerted organization-wide training models to support a more holistic productivity vision.

Hence, the overwhelming perception of productivity in Kuala Lumpur rests in the realm of profit: revenue maximization and cost minimization remain the metrics by which hotels in the city measure productivity.

Best Practices Adopted by Hotels

Ibis Hotel has implemented cashless payment options by leveraging different transaction modes (e.g., Alipay) to ease the payment process for customers from different countries. Additionally, it has also launched the Loyalty Room Program to retain customers. Front office workers are required

to enroll a minimum of 10 program members per month. To attract more customers during the COVID-19 pandemic, the hotel has partnered with Grabfood, Foodpanda, and various social media platforms as a way to increase F&B revenue and cope with the loss of incoming customers.

Technology adoption in Kuala Lumpur is especially low, with most technologies focused on the guest experience. In the budget and mid-tier segments, most technologies are related to internet connectivity and automated key card systems. In particular, automated key card systems are seen as critical opportunities to provide security assurance and customer confidence. Hence, this emerges as a key area of technology investment in the budget and mid-tier segments. Holiday Inn has upgraded its IT infrastructure for stronger Wi-Fi as connectivity and internet speed have become increasingly important among customers.

A hotel management system (Opera) has been adopted by Cititel Mid Valley to support and streamline overall hotel operations. In addition, the hotel adopted an online travel agent monitoring system to forecast revenue growth and understand and predict customer behaviors to make better decisions.

In all interviews conducted, respondents expressed little to low interest in technology adoption to enhance productivity. Hotel operations are still conducted traditionally with minimal change or innovation. To increase efficiency, cross-deployment and upskilling through internal training are the strategies used to equip employees with the right skills.

Low Government Support to Shape Industry Priorities

Governments have the opportunity to become critical players in driving productivity by shaping the productivity culture as a key performance indicator for industries, while also initiating monetary policies and grants to support productivity endeavors. In Kuala Lumpur, there has been limited government intervention in both aspects of the hotel industry, which explains why productivity remains low-priority when investment decisions are made. A government effort to prioritize productivity would allow hotel operators to court better buy-in from hotel owners, thus increasing support and awareness of productivity as a core performance indicator.

Further, while some hotels such as Koptown have managed to avail government relief from the Surhanjaya Koperasi Malaysia (SKM) fund, there has been little structured government effort to improve productivity. Frost & Sullivan notes that even with the SKM fund, Malaysia does not seem to have programs dedicated to technology incorporation or productivity enhancement initiatives. Government support has been critical in other cities to alleviate the high initial costs of embarking on productivity investments, making technology adoption more accessible and attractive to hotel owners. With few avenues for relief, significant costs associated with technology adoption will remain a critical barrier that hotels in Malaysia struggle to overcome without government intervention. Other hotels such as Holiday Inn cite the lack of government support as a dampening effect on motivation to pursue productivity, stating that hotels need initial support from grants to overcome the high start-up costs related to technology investments.

In addition, government efforts to promote the industry have largely been demand-centric, with tourism events and B2B efforts needed to drum up demand for Kuala Lumpur hotels. Hotels are sometimes invited to exhibitions to court overseas tourists and promote Kuala Lumpur as a tourism destination. Even so, hotels in various tiers have different experiences, with budget hotels such as Westlink stating that they have been largely left out of such B2B events.

With little to no involvement to boost productivity, the government has supported the hotel industry by organizing hotel road shows two to three times a year in collaboration with travel agents. In addition, there are programs developed for hotels to promote their products and services outside Malaysia (e.g., the target is the Middle East for the first quarter of the year, Europe for the second quarter, etc.), but hotels need to pay to participate in these programs. Despite these ongoing promotions, awareness about Malaysia remains lacking (for example, consider the comment: "Events like Visit Malaysia Year [are] not helpful, as many foreigners, e.g., Europeans, do not know about Malaysia").

Impact of COVID-19

While the pandemic has impacted the hotel industry worldwide, it has been particularly devastating for hotels in Kuala Lumpur. Frost & Sullivan notes that during its conversations with hotel managers, hotel closures are a consistent trend since the country started implementing the Movement Control Order in early 2020. This order effectively shut down both international and domestic tourism, leaving little to no demand for rooms. With limited cash flow, many local operators have shut their doors in recent months.

Furthermore, with many hotels ceasing operations and little expansion, they have been unable to maintain existing headcounts. Most hotels, particularly locally operated ones, have slashed headcounts and let existing staff go. This has resulted in a mass exodus of talent from the hospitality sector, which is bound to create major repercussions when hotel operations resume in the post-pandemic period.

To support the hotel industry, the Malaysian government has come up with campaigns to promote local tourism and provide subsidies for staff (under the economic stimulus package), such as RM600 for employees with monthly salaries below RM1,200.

Countermeasures for COVID-19

To cope with the reduced demand for rooms and dwindling occupancy levels, some budget and mid-tier hotels such as Crystal Crown have transformed themselves into quarantine centers. At this property, occupancy has risen to 80%, increasing revenue and creating sustainable cash flows. This strategy has allowed hotels to keep their doors open, particularly for locally operated smaller hotels in the budget and mid-tier segments.

Further, where hotels are operational, the renewed focus on sanitation and hygiene has forced many of them to reconsider their best practices. Most hotels have had to increase manpower in these areas and develop targeted cleaning practices to assure customers of their safety. Furthermore, hotels that were transformed into quarantine centers have strict protocols to adhere to, including making sanitization safeguards a core part of hotel operations.

In addition, operationally, many hotels have reduced their headcount, with many placing staff on a rotational work basis. Employees now work in shifts, with reduced hours to help the hotel cope with payroll pressure in a time of reduced cash flow. Many hotels have also implemented pay cuts.

Where other cities have been able to implement some form of 'staycation' packages to court local customer traffic, this strategy remains unfeasible in Kuala Lumpur. This is largely because the city has been placed under the Movement Control Order due to the rising COVID-19 infection

rates. Hence, hotels continuously have to cease operations, sometimes within weeks of reopening. Thus, even as international travelers have been absent, domestic tourism has also been largely non-existent due to uncertainty about future conditions after booking. Hence, hotels have been unable to rely on domestic tourism to create short-term cash flow, amplifying the effect of the pandemic. These challenges account for a large number of hotel closures, with Kuala Lumpur particularly affected.

Sanitization and Hygiene Critical to Ensure Consumer Confidence

Almost all hotel managers have expressed the view that the focus on sanitization and hygiene will be an enduring part of their customers' mindset. Hence, hotel managers feel that hotels will have to continue to maintain strict hygiene protocols to assure guest safety and restore customer confidence. Therefore, in the post-pandemic era, a renewed emphasis will be on the activities of housekeeping teams.

The pandemic has deeply affected the hotel industry. In a city where locally operated, standalone hotels outnumber branded hotels of international chains, the pandemic has created a shift in the industry landscape. With little steady cash flow, many struggling local operators have been unable to continue operations, closing down and exiting the market. Hotels belonging to chains and international brands have managed to keep afloat due to deeper reserves. In the post-pandemic age, the smaller locally operated hotels that still exit might face market consolidation, with bigger international brands expanding their presence.

HONG KONG

TABLE 238

INTERVIEW COUNT (HONG KONG).

Count	Overall	Luxury	Upscale	Mid-tier	Budget
Quantitative	20	5	5	5	5
Qualitative	11	1	5	2	3

Hotel Metrics

Efficiency Indicator: Revenue per Worker across Cities over Five Years

TABLE 239

OVERALL ANNUAL REVENUE PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	127,236	65,126	74,027	44,287	87,119	111,061	89,595
2016	128,963	64,640	73,126	45,593	87,412	106,414	94,468
2017	126,869	76,787	75,034	46,467	88,265	99,675	90,674
2018	145,839	81,480	82,080	48,416	84,057	99,987	90,240
2019	170,607	80,930	81,537	59,903	107,687	130,722	111,507
Average	139,903	73,793	77,161	48,933	90,908	109,572	95,297
Growth between 2015 and 2019	34%	24%	10%	35%	24%	18%	24%

Revenue per Worker by Tier over Five Years (Hong Kong)

TABLE 240

ANNUAL REVENUE PER WORKER IN HONG KONG (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	112,017	66,811	92,202	39,640
2016	109,985	68,054	92,769	51,864
2017	110,000	67,870	93,590	57,304
2018	96,104	67,576	98,974	44,611
2019	103,562	94,811	131,604	89,855
Average	106,334	73,024	101,828	56,655
Growth between 2015 and 2019	8%	42%	43%	127%

Across all cities, Seoul, Singapore, and Tokyo have the highest revenue per worker. Revenue per worker is slightly lower for Hong Kong when compared to other well-developed cities, with an average of USD90,908 between 2015 and 2019; a stable increase of 24% is seen, indicating healthy productivity growth. Hong Kong experiences a healthy level of productivity and profitability in the hotel industry, as explained below.

Across all tiers, luxury and mid-tier hotels have the highest profitability due to lower FTEs. Budget hotels experienced the highest growth rate amongst all tiers with an increase of 127% from 2015 to 2019, indicating high productivity improvement. This may be due to the increased adoption of technological tools and gadgets such as iPad and self-service kiosks, as well as increased visits by Chinese tourists which have resulted in higher profitability margins.

Hotel Industry Dynamics from 2015 and 2019

The hotel industry growth is largely dependent on the activities in a nation's tourism industry. Hong Kong is the top destination hub during the study period, with an estimated occupancy rate of 80%. According to the Census and Statistics Department of Hong Kong [20], the majority of tourists come from neighboring countries, such as Mainland China, Taiwan, South Korea, and Japan. Tourism is one of the government's top priorities as it is one of the main sources of income along with international trade and financial services. However, tourism dropped significantly in 2019 due to the Yellow Umbrella Movement. The higher revenue per worker in Hong Kong can be attributed to the tourism boom that resulted in higher profitability.

TABLE 241

NUMBER OF INBOUND TOURISTS IN HONG KONG.

	2015	2016	2017	2018	2019
Hong Kong	45,840,000	42,780,000	44,450,000	51,040,000	43,770,000

Table 241, Number of Inbound Tourists in Hong Kong, reflects the fluctuation in the number of inbound tourists from 2015 to 2016 and from 2018 to 2019, with a year-on-year decrease of 7% and 14%, respectively, caused by the city's political strife.

The fast-paced society in Hong Kong spurs productivity initiatives, particularly among mid-tier and budget hotels. Unlike other cities where mid-tier and budget hotels are usually standalone, there are numerous franchise hotels within these segments like Ibis Hotel, L Hotel, Butterfly Wellington Hotels, and iClub Hotel. As such, many of them have more capital to fund new technologies and equipment to streamline overall processes.

Labor Productivity Indicator: Value Add per Worker across Cities over Five Years

TABLE 242

OVERALL ANNUAL VALUE ADD PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	86,383	31,908	47,300	29,691	68,988	91,646	65,053
2016	87,357	34,061	47,555	32,296	70,304	87,340	65,207

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	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2017	88,843	38,583	49,314	30,624	72,295	83,197	62,010
2018	101,230	42,199	55,860	31,899	68,706	82,753	61,696
2019	114,555	38,111	55,370	37,792	86,961	103,824	73,775
Average	95,674	36,972	51,080	32,461	73,451	89,752	65,548
Growth between 2015 and 2019	33%	19%	17%	27%	26%	13%	13%

Value-add per worker is an indicator of productivity, showing how much value has been generated by each employee. Hong Kong displays a relatively lower value-add per worker in comparison to other well-developed cities. The value-add per worker has grown at a steady pace of 26% over the past five years. Productivity efforts have been deployed across multiple hotel functions as explained below. Overall, luxury and mid-tier hotels see the highest value-add per worker due to their increased productivity. The current analysis indicates a higher productivity rate in this city.

Value Add per Worker by Tier over Five Years (Hong Kong)

TABLE 243

ANNUAL VALUE ADD PER WORKER IN HONG KONG (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	93,176	64,071	62,980	30,092
2016	91,135	65,241	65,256	29,975
2017	91,335	64,644	69,101	39,775
2018	78,754	64,232	74,238	30,824
2019	82,328	90,204	94,609	86,437
Average	87,346	69,678	73,237	43,421
Growth between 2015 and 2019	-12%	41%	50%	187%

Technological Gadgets in Front Office to Expedite Check-in Process

Hotels in Hong Kong are more receptive to using technology to carry out tasks as it helps to reduce the manpower needed to complete workloads. In the cultural context, Hong Kong is one of the fastest-paced cities in Asia, where speed and accuracy are crucial to society as a whole. As such, hotels in Hong Kong have a different set of indicators to measure success as efficiency is deeply rooted across the nation.

Thus, efficiency and effectiveness are the core metrics for gauging productivity objectives for mid-tier and budget hotels. Hotels within these segments have a lower average daily rate in comparison to those in the luxury and upscale tiers. To maintain a healthy profit margin, productivity is crucial to ensure proper expense management. The term 'efficiency' refers to the time taken to complete a task while the term effectiveness refers to how precisely or accurately the task has been executed. Taking the two metrics into account, hotels within the mid-tier and budget segments look for ways

to reduce customer waiting time to increase and improve the overall guest experience during their stay. In addition, the use of iPads is prevalent across hotels of various tiers as they are simple to use and implement. Examples of how iPads have supported hotels to improve productivity and efficiency will be elaborated upon in the Best Practices Adopted by Hotels section.

Profitability Indicator: Gross Operating Profit per Worker across Cities over Five Years

TABLE 244

OVERALL ANNUAL GROSS OPERATING PROFIT PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	54,683	32,865	26,842	28,735	75,197	69,297	55,102
2016	55,558	33,870	24,872	31,806	67,310	66,899	55,963
2017	57,888	37,464	26,069	30,461	68,655	65,001	56,293
2018	57,888	41,175	32,018	32,770	65,645	69,322	53,075
2019	66,816	38,827	32,084	39,372	90,316	84,729	66,175
Average	82,995	36,840	28,176	32,359	72,669	70,494	57,073
Growth between 2015 and 2019	22%	18%	20%	37%	20%	22%	20%

Gross Operating Profit per Worker by Tier over Five Years (Hong Kong)

TABLE 245

ANNUAL GROSS OPERATING PROFIT PER WORKER IN HONG KONG (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	76,922	62,479	74,255	30,092
2016	74,533	63,757	76,002	29,975
2017	75,847	63,470	76,650	39,775
2018	63,468	63,519	82,826	30,824
2019	63,352	89,539	114,938	86,437
Average	70,824	68,553	84,934	43,421
Growth between 2015 and 2019	-18%	43%	55%	187%

Gross operating profit per worker is measured as the profitability generated by each worker. Across all cities, a similar high profitability trend is seen among the well-developed cities of Hong Kong, Singapore, and Tokyo. Hong Kong ranks among the top three in terms of gross operating profit per worker; the calculated indicator is slightly higher than in Seoul and Singapore. This indicates a higher productivity level with technology integrated to support overall efficiency and operations. The highest gross profit per worker is seen in luxury and mid-tier hotels. Budget hotels experienced a growth spurt during the five years studied due to increased productivity.

Efficiency Indicator: Operating Cost per Worker across Cities over Five Years

TABLE 246

OVERALL ANNUAL OPERATING COST PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40,854	33,218	26,727	14,596	18,131	19,415	24,542
2016	41,607	30,579	25,570	13,297	17,108	19,074	29,261
2017	38,026	38,204	25,720	15,843	15,970	16,478	28,665
2018	44,609	39,281	26,220	16,517	15,351	17,234	28,545
2019	56,051	42,819	26,167	22,111	20,726	26,898	37,731
Average	44,229	36,820	26,081	16,473	17,457	19,820	29,749
Growth between 2015 and 2019	37%	29%	-2%	51%	14%	39%	54%

Operating Cost per Worker by Tier over Five Years (Hong Kong)

TABLE 247

ANNUAL OPERATING COST PER WORKER IN HONG KONG (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	18,841	2,740	29,222	16,903
2016	18,850	2,813	27,513	14,946
2017	18,665	3,226	24,489	11,145
2018	17,350	3,344	24,736	8,030
2019	21,234	4,607	36,995	12,225
Average	18,988	3,346	28,591	12,650
Growth between 2015 and 2019	13%	68%	27%	-28%

The operating cost per worker in Hong Kong is the lowest among all cities. This is because a majority of the data points come from the budget and mid-tier hotels. As such, figures may be skewed towards the lower end. Despite having high revenue per worker, Hong Kong sees a much lower operating cost in comparison with other developed cities. This demonstrates a higher level of productivity as lower operating costs are required to support hotels' daily operations.

Across the different indicators used, a trend of lower expenses and higher revenue is observed through integrating technology and adopting new strategies to enhance overall productivity. Operating cost in Hong Kong across the tiers is significantly lower than in other cities due to a high utilization rate of outsourced employees.

Profitability Indicator: Average Room Rate across Cities over Five Years

TABLE 248

OVERALL AVERAGE ROOM RATE (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	207	141	158	119	169	160	186
2016	202	136	154	125	178	164	230
2017	197	144	152	116	177	159	226
2018	193	149	145	131	194	154	255
2019	195	132	140	116	179	156	259
Average	199	140	150	121	179	159	231
Growth between 2015 and 2019	-6%	-7%	-12%	-3%	6%	-2%	39%

Average Room Rate by Tier over Five Years (Hong Kong)

TABLE 249

AVERAGE ROOM RATE IN HONG KONG (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	409	163	106	43
2016	429	173	111	48
2017	396	194	115	52
2018	429	222	117	65
2019	407	177	126	51
Average	414	186	115	52
Growth between 2015 and 2019	0%	8%	19%	18%

Despite being one of the most expensive cities, Hong Kong has a relatively low ARR as compared to other developed cities. This is due to the lower purchasing parity power compared to Singapore and Tokyo, as well as a higher proportion of mid-tier and budget hotels in the sample count. Luxury hotels exhibit the highest ARR in all cities due to their esteemed positioning. Price differentiation is distinct across all tiers due to the dynamic nature of the hotel industry. Analyzing each tier, all except for luxury hotels see an upward growth in ARR, indicating positive profitability growth. It is noted that the mid-tier segment sees the highest growth of 19% due to an increased number of overnight stays from neighboring cities such as Guangzhou and Shenzhen.

Profitability Indicator: Revenue per Available Night (RevPAR) across Cities over Five Years

TABLE 250

OVERALL RevPAR (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	150	125	129	87	129	101	124
2016	149	107	128	90	131	110	141
2017	141	133	123	90	136	110	138
2018	146	122	114	98	165	107	164
2019	149	101	115	87	149	111	138
Average	147	118	122	90	142	108	141
Growth between 2015 and 2019	-1%	-19%	-11%	0%	16%	10%	12%

RevPAR by Tier over Five Years (Hong Kong)

TABLE 251

RevPAR IN HONG KONG (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	317	97	100	34
2016	311	99	105	37
2017	335	95	105	40
2018	361	102	190	48
2019	319	86	195	32
Average	329	96	139	38
Growth between 2015 and 2019	1%	-11%	95%	-7%

RevPAR in Hong Kong is on the lower side as compared to the other developed cities. Considering all four tiers, upscale hotels have a lower ARR than the ARR across this segment in all other cities, indicating lower profitability per available room.

Utilization Indicator: Average Occupancy Rate across Cities over Five Years

TABLE 252

OVERALL AVERAGE OCCUPANCY RATE.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	85%	82%	71%	71%	81%	84%	83%
2016	86%	81%	72%	72%	85%	85%	82%
2017	84%	80%	71%	72%	86%	87%	83%

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	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2018	87%	83%	71%	66%	86%	83%	84%
2019	87%	80%	71%	65%	79%	89%	85%
Average	86%	81%	71%	69%	83%	86%	84%
Growth between 2015 and 2019	2%	-2%	0%	-8%	-2%	6%	2%

Average Occupancy Rate by Tier over Five Years (Hong Kong)

TABLE 253

AVERAGE OCCUPANCY RATE IN HONG KONG.

	Luxury	Upscale	Mid-tier	Budget
2015	100%	77%	79%	91%
2016	82%	91%	79%	91%
2017	83%	91%	79%	91%
2018	78%	93%	80%	90%
2019	70%	86%	73%	85%
Average	83%	88%	78%	90%
Growth between 2015 and 2019	-30%	12%	-8%	-7%

In Hong Kong, the AOR is relatively high at 79% as compared to the other well-developed cities. The high AOR may be the result of a tourism boom, with Hong Kong being one of the leading destination hubs in Asia, although occupancy decreased slightly by 3% from 2018 to 2019 due to political riots. Hong Kong demonstrates a higher level of productivity readiness as compared to other cities; the sections below offer different perspectives on productivity from the four hotel tiers. All tiers have been impacted by the political unrest, especially budget hotels where security and safety are core considerations during turbulent periods.

Perception of Productivity

Overall, hotel managers in Hong Kong report that productivity, in essence, is a measurement of profitability, market share, the number of hotel guest stays, and customer satisfaction. Looking across the tiers, luxury and upscale hotels tie productivity to overall customer satisfaction while ensuring business profitability. These hotels focus on customer satisfaction and guest experience in exchange for premium pricing and service standards with their brand image. While productivity has been reported as equally important as profitability, hotels within this classification emphasize face-to-face interaction and human touch points as priorities. Front office crews are seen as hotel ambassadors as they are the first customer touch point when a guest arrives.

In this regard, to reduce waiting time for customers, Hyatt Centric Victoria Harbour (upscale), East Hotel (mid-tier), and Nina Hotel Island South (previously known as L hotel) (mid-tier) have implemented self-service check-in options through the use of iPads. Though service staff has to be

stationed to support any guest inquiry or difficulty, the self-service check-in process has managed to reduce customers' overall waiting time, especially during peak hours. iClub Hotel, a budget hotel under Regal Hotel International, was reported as the first hotel in Hong Kong to introduce 'mobile keys' to speed up the overall check-in process. Before arrival, a guest will have to download the iclub Hotels Mobile Key app to verify their profile and registration. Upon completion, the guest will receive hotel details 72 hours before check-in, and their room number will be provided upon arrival and verification of their profile. The use of the mobile key has helped expedite the check-in process and allow hotels to profile and understand the demographic of their guests in advance. Also, the mobile key is a multiple-purpose function app that allows customers to reduce the hassle of having to carry physical cards.

Similarly, the budget hotel Butterfly on Wellington Boutique Hotel has implemented self-check-in kiosks that allow guests to scan their passports for verification and complete payment, with different modes of payment available (e.g., Alipay, Apple Pay, and WeChat Pay). Mid-tier and budget hotels have innovated ways to streamline operations and reduce headcounts to ensure healthy profit margins. While hotel operators in other cities have concerns that the use of self-check-in might affect customer satisfaction, Hong Kong hotels are more inclined to leverage such technologies despite the drop in human interaction because they expedite processes.

Best Practices Adopted by Hotels

iPads and Robotic Machines to Support Key Hotel Functions

The increasing costs of manpower and operations have been a key reason why hotels are exploring new technology gadgets to improve productivity. Hotels in Hong Kong are generally more receptive to using technology to enhance efficiency and reduce manpower. For instance, both Hyatt Centric Victoria Harbour and East Hotel have incorporated cleaning robots as an initiative to reduce the workload on their housekeeping team. Other hotels, however, have reservations about these technologies due to user barriers. Many members of the housekeeping staff are retirees or housewives with little to no technical knowledge. Hence, the low technological competency has led to more resources needed to educate employees and ensure they are well-equipped with the skills needed to operate the technology.

Moreover, these minimally tech-savvy employees leverage communication platforms such as WeChat and WhatsApp to get real-time information on the number of rooms required for cleaning. The supervisor in charge will have an iPad available to figure out the number of rooms needed for cleaning and inform relevant housekeeping members of their tasks.

Impact of Programs and Initiatives to Reduce Wastage

Apart from implementing technology in the front office and housekeeping departments, East Hotel has embarked on a Sustainable Development Program to reduce waste. It has had a positive impact on productivity as it allows staff to focus on training, increases staff development, and helps retain employees. Under this program, the hotel has implemented more sensors in toilets, faucets, and gym rooms to reduce water and electricity wastage. Additionally, any unfinished food from F&B kitchens will be given to food banks as part of the hotel's corporate social responsibility. Staff members are encouraged to take up charity projects and participate in volunteering or recycling programs.

Development of QR Codes

As technology use becomes more prevalent across all demographics, hotels have evolved to remain relevant to their customers. To stay connected with customers, hotels have digitalized modes of

payment through the use of QR codes. QR codes were adopted way before COVID-19 by Cordis Hotel (mid-tier) as a way for customers to view their menus on their mobile phones. Now, the QR codes enable customers to pay through different modes (e.g., credit/debit card, Alipay, WeChat, or Apple Pay).

Back-end Operation to Support Frontline Staff

Hotels across the tiers have incorporated hotel management tools to understand and analyze existing gaps and to forecast customer flow and manpower. Hotels have consistently upgraded their systems to ensure their staff can complete their tasks more efficiently. In-house training programs have been initiated consistently to ensure that employees have the skill sets needed before embarking on the upgraded system. The use of such hotel management tools has allowed employees to coordinate through real-time communication and updates. For instance, back-end hotel management tools are linked to the front office, which allows service staff to see room status in real-time and deploy housekeeping to clean and sanitize the rooms quickly if needed. Bed Room Systems have been implemented to see room status upon guest departure or arrival. This approach synchronizes the overall operational flow, making room transitions easier for service staff. Sensors have been implemented in public cleaning areas to detect the level of dirt and traffic flow and to notify relevant staff members to clean and sanitize when required.

Customer Satisfaction Remains Crucial

Productivity is one of the most crucial components among hotels in Hong Kong; however, the fear remains that the adoption of too much technology may affect customer satisfaction. Other areas of concern stem from the lack of technological awareness among staff that may lead to more resources and time being invested in imparting them with the right skill sets.

While hotels across all tiers have integrated technology as part of their operations to reduce process hassles and to downsize manpower requirements, many hotels have expressed that customer satisfaction is still the core of the hotels' performance metrics. Human interaction remains highly valued in the industry, particularly amongst luxury and upscale hotels. Therefore, to ensure technology does not affect customer satisfaction, Hyatt Centric Victoria Harbour has implemented a survey and chatbots to understand customer sentiment during their stay. This data is calculated via the Hyatt customer satisfaction matrix, to measure customer service and satisfaction levels as rated by guests upon check-out.

Lack of Young Blood in the Hotel Industry Impedes Productivity

There is a lack of younger employees at hotels in Hong Kong; most of the employees in this industry are in an older age group. The lack of younger employees has hampered the possibility of innovation or new strategies to improve productivity to bring about change. As such, to attract younger workers, Butterfly Wellington (budget hotel) introduced a management trainee program in which the selected trainee will be put on a four-year program in which they work various jobs before being promoted to assistant manager.

Impact of COVID-19

Hotels in Hong Kong have experienced low occupancy rates across the board due to the travel ban. The COVID-19 pandemic created challenges due to border closures and activities to reduce the number of transmitted cases. While Hong Kong has managed to bounce back faster than the other cities due to better control of the pandemic, the lack of foreign tourists has caused a loss in revenue.

Hotels have updated their business plans and strategies to curb the ongoing challenges via the following approaches.

Reduce Manpower Costs

- Hiring freezes across the board help reduce headcount and additional manpower costs.

- Currently, retrenchment does not exist as the regulation in Hong Kong protects employment through severance pay if companies do not adhere to the regulations. As such, to utilize human resources, companies split teams to reduce headcount per shift, and staff who are not working are asked to clear data entry backlogs and complete online training courses.

- Additional headcounts are encouraged to take leave of absence.

New Strategies to Bring in Revenue

- More focus is given to the F&B services through promotions and the creation of new dishes to bring in revenue and compensate for the loss of revenue from hotel stays. For instance, strategies include the new F&B offering of 'Dunch' (Lunch + Dinner) and a heavier tea time package for different customers (especially those who would like to dine in).

- To increase occupancy rates, hotels provide new product offerings where local citizens/tourists who are stuck in Hong Kong can purchase a 'subscription plan' with the Butterfly group to stay at any of its properties in Hong Kong at any time, with room availability guaranteed.

- More promotional efforts are created that encourage local citizens to book staycations early or engage with loyalty programs and promotional bundles that include free F&B vouchers.

Increase Hygiene and Sanitization

- Hotels across the board face higher requirements on cleanliness and hygiene. Housekeeping and other cleaning teams are required to clean rooms and public areas more frequently than they did during pre-COVID-19 times.

- Hotels must purchase more cleaning equipment and detergents to ensure proper sanitization standards are met so that customers feel safe staying with them.

Leverage Technology to Reduce Contact

- Productivity among hotels in Hong Kong is perceived to be much higher than in their neighboring cities due to early technology implementation. Self-service kiosks are used more with the current need to reduce the contact between staff members and customers. This enables Hong Kong hotels to operate better during this period and adjust to the current climate.

- While technological tools have been put to better use, many hotels, especially mid-tier hotels, are halting technology investments to reduce operating costs.

SEOUL

TABLE 254

INTERVIEW COUNT (SEOUL).

Count	Overall	Luxury	Upscale	Mid-tier	Budget
Quantitative	20	5	5	5	5
Qualitative	6	4	0	1	1

Hotel Metrics

Efficiency Indicator: Revenue per Worker across Cities over Five Years

TABLE 255

OVERALL ANNUAL REVENUE PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	127,236	65,126	74,027	44,287	87,119	111,061	89,595
2016	128,963	64,640	73,126	45,593	87,412	106,414	94,468
2017	126,869	76,787	75,034	46,467	88,265	99,675	90,674
2018	145,839	81,480	82,080	48,416	84,057	99,987	90,240
2019	170,607	80,930	81,537	59,903	107,687	130,722	111,507
Average	139,903	73,793	77,161	48,933	90,908	109,572	95,297
Growth between 2015 and 2019	34%	24%	10%	35%	24%	18%	24%

Seoul has one of the highest revenues per worker figures observed. Even as the city faces moderately high manpower costs, with a minimum wage of USD7.92 [21], it has managed to record the highest revenue per worker. This is largely a result of the productivity drive seen in the hotel industry. With a consistent commitment to cross-deployment and job rotation, manpower deployment in the city is among the most productive in comparison to the other cities studied. Hence, as labor is deployed more productively, the revenue per worker obtained ranks at a higher level than the other developed cities of Hong Kong, Singapore, and Tokyo.

Revenue per Worker by Tier over Five Years (Seoul)

TABLE 256

ANNUAL REVENUE PER WORKER IN SEOUL (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	117,193	148,425	54,506	78,099
2016	110,944	147,312	54,303	72,452

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	Luxury	Upscale	Mid-tier	Budget
2017	101,978	153,130	53,050	71,198
2018	101,766	155,990	52,226	73,102
2019	136,046	243,364	64,172	73,868
Average	113,585	169,644	55,651	73,744
Growth between 2015 and 2019	16%	64%	18%	-5%

Of all tiers, Seoul sees the highest profitability in annual revenue per worker in the luxury and upscale hotels due to their high ARR and AOR.

TABLE 257

NUMBER OF INBOUND TOURISTS IN SOUTH KOREA.

	2015	2016	2017	2018	2019
South Korea	13,230,000	17,240,000	13,340,000	15,350,000	17,500,000

Source: Statista, Travel, Tourism & Hospitality, Number of Inbound Visitors to South Korea from 2000 to 2021

The tourism industry growth has a direct effect on hotel industry revenue. The high revenue per worker in Seoul may indicate high growth in the tourism industry as seen from 2015 to 2019. In recent years, South Korea has gained significant attention due to the booming KPOP industry that promotes tourism in the country. In addition, growth in medical travel has contributed to growth in the tourism industry.

Labor Productivity Indicator: Value Add per Worker across Cities over Five Years

TABLE 258

OVERALL ANNUAL VALUE ADD PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	86,383	31,908	47,300	29,691	68,988	91,646	65,053
2016	87,357	34,061	47,555	32,296	70,304	87,340	65,207
2017	88,843	38,583	49,314	30,624	72,295	83,197	62,010
2018	101,230	42,199	55,860	31,899	68,706	82,753	61,696
2019	114,555	38,111	55,370	37,792	86,961	103,824	73,775
Average	95,674	36,972	51,080	32,461	73,451	89,752	65,548
Growth between 2015 and 2019	33%	19%	17%	27%	26%	13%	13%

Value Add per Worker by Tier over Five Years (Seoul)

TABLE 259

ANNUAL VALUE ADD PER WORKER IN SEOUL (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	102,072	119,056	33,957	28,045
2016	94,639	126,945	34,031	24,479
2017	88,816	132,694	33,591	24,415
2018	87,302	137,235	32,458	28,977
2019	112,525	201,244	41,384	27,646
Average	97,071	143,435	35,084	26,712
Growth between 2015 and 2019	10%	69%	22%	-1%

Seoul has a high value-add per worker, ranking only below Singapore. The city's high value-add per worker supports the above-report analysis of revenue per worker. Digitalization has supported productivity growth in Seoul; it has diversified the way hotel services are delivered, improved hotels' internal systems, and transformed business processes.

RYSE Hotel, a luxury hotel management group, has reported an uptake in digitalization in the industry. Hotel management brands are creating applications to stay digital and connected to consumer groups. By leveraging digital technologies, hotels can focus on improving efficiency and productivity in their business processes, as employees can reduce the time needed to process paperwork and administrative tasks.

Across the board, the hotel managers surveyed agree that productivity initiatives have helped reduce idle time, re-strategize manpower deployment, and improve customer satisfaction while ensuring business continuity through profit growth. However, the sentiment is more muted in the luxury segment where hotel managers routinely express the fear that an over-emphasis on technology as a means of chasing productivity may negatively impact customer satisfaction. Hotels in this tier put greater emphasis on the quality of service and personalization. Hence, luxury hotels have largely shied away from large-scale adoption of customer-facing technologies that reduce face-to-face service opportunities in the front office. Productivity within this tier largely revolves around the quality of services rendered, with less attention paid to input costs and time. Some hotels such as Millennium Hilton have even appointed a guest relations officer to address customer dissatisfaction while modernizing manpower deployment to reduce negative experiences. The hotel's manager emphasized that human interaction is a critical tool in ensuring loyalty and guest retention, and it cannot be replaced by technology.

Digitalization, integration of technologies, and strategic manpower deployment have increased overall productivity; therefore, strong value-add per worker in Seoul is observed.

Profitability Indicator: Gross Operating Profit per Worker across Cities over Five Years

TABLE 260

OVERALL ANNUAL GROSS OPERATING PROFIT PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	54,683	32,865	26,842	28,735	75,197	69,297	55,102
2016	55,558	33,870	24,872	31,806	67,310	66,899	55,963
2017	57,888	37,464	26,069	30,461	68,655	65,001	56,293
2018	57,888	41,175	32,018	32,770	65,645	69,322	53,075
2019	66,816	38,827	32,084	39,372	90,316	84,729	66,175
Average	82,995	36,840	28,176	32,359	72,669	70,494	57,073
Growth between 2015 and 2019	22%	18%	20%	37%	20%	22%	20%

Gross operating profit per worker is measured as the profitability generated by each worker. Across all cities, Singapore, Hong Kong, and Tokyo have the highest profitability. Seoul falls slightly below these three cities, with gross operating profit per worker standing at USD72,669. However, where most cities have seen dips in gross operating profit per worker in recent years, Seoul is the only city recording an increase in 2019.

This is an indicator of the direction Seoul's hotel industry is taking. Increasingly, the self-service model has been gaining traction in the city, with customers and hotel managers alike embracing technology as a critical service provider. Hotels are starting to pivot to smart room systems (such as e-Housekeeping and N-bot) to provide less manpower-intensive solutions to customers and shifting to automation such as robotic cleaning devices to streamline manpower deployment. This increased motivation to boost productivity within the industry will translate to an upward trend in profitability.

Gross Operating Profit per Worker by Tier over Five Years (Seoul)

TABLE 261

ANNUAL GROSS OPERATING PROFIT PER WORKER IN SEOUL (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	73,232	105,901	26,057	28,045
2016	68,474	115,653	25,189	24,479
2017	65,609	123,814	25,206	24,415
2018	86,177	131,112	23,505	28,977
2019	109,502	179,933	31,288	27,646
Average	80,599	131,283	26,249	26,712
Growth between 2015 and 2019	50%	70%	20%	-1%

Of all tiers, luxury and upscale have the highest level of gross operating profit per worker due to overall improvements in processes through adopting new technologies and leveraging outsourced employees.

Efficiency Indicator: Operating Cost per Worker across Cities over Five Years

TABLE 262

OVERALL ANNUAL OPERATING COST PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40,854	33,218	26,727	14,596	18,131	19,415	24,542
2016	41,607	30,579	25,570	13,297	17,108	19,074	29,261
2017	38,026	38,204	25,720	15,843	15,970	16,478	28,665
2018	44,609	39,281	26,220	16,517	15,351	17,234	28,545
2019	56,051	42,819	26,167	22,111	20,726	26,898	37,731
Average	44,229	36,820	26,081	16,473	17,457	19,820	29,749
Growth between 2015 and 2019	37%	29%	-2%	51%	14%	39%	54%

Operating Cost per Worker by Tier over Five Years (Seoul)

TABLE 263

ANNUAL OPERATING COST PER WORKER IN SEOUL (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	15,121	29,369	20,549	51,161
2016	16,305	20,367	20,272	48,961
2017	13,161	20,436	19,459	44,088
2018	14,464	18,755	19,768	41,649
2019	23,521	42,120	22,788	43,266
Average	16,514	26,210	20,567	45,825
Growth between 2015 and 2019	56%	43%	11%	-15%

The operating cost per worker is an efficiency ratio that measures expense per employee. We can see that at USD24,928, Seoul has a lower operating cost per worker than the other developed cities of Singapore and Tokyo. However, this level is still higher than that of Hong Kong.

The low operating cost indicates high productivity in Seoul. While labor cost is a core concern amongst hotel managers, the city has been progressive in implementing new technologies to support the high labor cost. Moreover, with Seoul's target customers being technologically savvy and open to technology-based smart systems, the industry has embraced digitalization and automation in core business processes to drive productivity growth in the city's hotel sector.

Across all tiers, Seoul witnesses low operating costs. This aligns with our analysis that the higher technology adoption rate and utilization of outsourced employees will bring about better profit margins.

Profitability Indicator: Average Room Rate across Cities over Five Years

TABLE 264

OVERALL AVERAGE ROOM RATE (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	207	141	158	119	169	160	186
2016	202	136	154	125	178	164	230
2017	197	144	152	116	177	159	226
2018	193	149	145	131	194	154	255
2019	195	132	140	116	179	156	259
Average	199	140	150	121	179	159	231
Growth between 2015 and 2019	-6%	-7%	-12%	-3%	6%	-2%	39%

Average Room Rate by Tier over Five Years (Seoul)

TABLE 265

AVERAGE ROOM RATE IN SEOUL (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	308	208	105	58
2016	312	216	110	58
2017	307	214	115	60
2018	267	194	117	60
2019	256	211	117	61
Average	290	209	113	59
Growth between 2015 and 2019	-17%	2%	11%	7%

The average room rate is the measurement of room rates generated from occupied rooms. Looking across all cities, Singapore and Tokyo have the highest ARR, with Seoul having a comparatively lower ARR than other developed cities in the study. In addition, hotel ARR aligns with the overall pricing strategy across all tiers. In the luxury tier, however, ARR has depreciated due to an increase in the number of hotel supplies, which decreases the ARR price point.

Profitability Indicator: Revenue per Available Night (RevPAR) across Cities over Five Years

TABLE 266

OVERALL RevPAR (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	150	125	129	87	129	101	124
2016	149	107	128	90	131	110	141
2017	141	133	123	90	136	110	138
2018	146	122	114	98	165	107	164
2019	149	101	115	87	149	111	138
Average	147	118	122	90	142	108	141
Growth between 2015 and 2019	-1%	-19%	-11%	0%	16%	10%	12%

RevPAR by Tier over Five Years (Seoul)

TABLE 267

RevPAR IN SEOUL (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	163	147	67	42
2016	175	164	72	44
2017	164	178	72	45
2018	161	157	77	45
2019	168	167	75	47
Average	166	163	72	45
Growth between 2015 and 2019	3%	14%	11%	12%

RevPAR is a profitability ratio used to measure the room's revenue generated from available rooms. Across all cities, Singapore and Tokyo have the highest RevPAR. Seoul, amongst all developed cities, has a relatively lower RevPAR. The luxury and upscale segments display continually high RevPAR while mid-tier and budget hotels have lower RevPAR.

Utilization Indicator: Average Occupancy Rate across Cities over Five Years

TABLE 268

OVERALL AVERAGE OCCUPANCY RATE.

	Bangkok	Singapore	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	85%	80%	79%	67%	71%	66%	82%
2016	87%	84%	82%	66%	79%	70%	79%

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	Bangkok	Singapore	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2017	90%	78%	74%	69%	80%	63%	80%
2018	87%	84%	70%	54%	83%	59%	81%
2019	87%	94%	69%	58%	80%	64%	80%
Average	87%	84%	75%	63%	79%	64%	80%

Of all cities, Seoul has the second-lowest AOR, despite being a top travel destination in Asia. China and Japan account for the bulk of the city's core visitor composition. The lower occupancy rate is largely a result of political tensions between China and Seoul that resulted in a 2017 ban on tourist groups traveling from China to South Korea. This decline in tourist arrivals from China lasted through the 2018 Winter Olympics, which would have otherwise increased AOR. Even as political sentiments between the two countries have been improving, with the ban's reach easing in 2020, the pandemic has delayed any plans to revise this.

Perception of Productivity

Productivity is denoted as the correlation between profit and cost. Collectively, a high investment in and adoption of productivity initiatives across the hotel tiers is practiced due to manpower constraints. Productivity is seen as a pivotal factor to improve profit margins, introduce new customer experiences through innovation, and streamline operational processes. In Seoul, a high level of technology adoption is practiced to reduce labor and workload.

Best Practices Adopted by Seoul's Hotel Industry

Upskilling Employees

Seoul's hotels have devised various ways to mitigate the effect of climbing manpower costs on profitability. Upskilling and cross-deployment have been critical to ensuring operational preparedness and easy response to dynamic needs and gaps in business. For example, Hilton has devised a rewards-based system to promote and recognize staff performance by incentivizing employees to commit to the retraining and upskilling programs it offers. Furthermore, outstanding employees are recognized through the provision of an excellent service award and salary increments to increase their motivation to commit to the hotel's productivity initiatives. Other programs such as leadership advancement or private institution training have been introduced to cultivate a productivity-driven mindset among employees and help them achieve high-quality performance.

Strategic Manpower Deployment

The majority of hotels interviewed report increased manpower costs. This is of particular concern amongst luxury hotels, where the emphasis on customer satisfaction and guest interaction has translated into high employee-to-guest ratios. For instance, the Novotel Ambassador Seoul, a luxury hotel, reported that labor costs account for the bulk of the hotel's operating costs due to Seoul's fixed-wage model. While it has increased the overall cost of manpower, the fixed-wage salary model has given hotels the flexibility to maximize employees' hours without having to revise their weekly time sheets. This reduces the additional time needed to forecast and plan for manpower resources, unlike in countries with a variable wage model.

As another example, RYSE Hotel has also emphasized the importance of the strategic deployment of manpower in its productivity initiatives. Sufficient manpower deployment is especially critical in the luxury segment where human interaction provides opportunities for personalization that will boost customer satisfaction. Hence, the hotel's employees must be able to rise above the standard operating procedure to remain agile and flexible when facing different customer profiles. As such, the hotel has concentrated on technology adoption in its back-end operations. This has helped decrease the number of hours spent on back-end operations and streamlined operational flow to reduce unnecessary paperwork and approval. As a result, the hotel gains freed-up time for its staff to concentrate on front-end functions that will improve the guest experience.

Further, the majority of hotels surveyed in Seoul outsource their stewarding and housekeeping functions. The reduced spending has helped them reduce fixed manpower costs and increase productivity.

Technology Adoption within Seoul's Hotel Industry

In the past few years, the use of hotel management tools has rapidly shaped the hospitality ecosystem. Hotel management tools help hotels eliminate idle time and enhance productivity. For instance, the RYSE Hotel has invested in revamping its internal systems through an investment in a European hotel management software called SMART Hotel. This co-created digital solution positions the hotel to perform cluster services within its back-end operations to streamline processes through cloud-based computing software.

This technology adoption trend is prevalent across luxury hotels like the InterContinental Grand Seoul Parnas. New applications such as iAlive and e-Housekeeping have helped the hotel boost productivity, work efficiently, and improve customer satisfaction. The incorporation of the two tools has reduced housekeeping service time from an hour to 50 minutes on average. These systems allow employees to track the time taken to clean rooms, enabling real-time information to be uploaded to the system. As such, the hotel can track and benchmark the average time needed for housekeeping, which enables more accurate forecasting and manpower deployment.

Hotels have also begun to embrace customer-facing technologies to attract tech-savvy customers. Millennium Seoul Hilton has implemented an order service, a digitized system that allows guests to order food online through its Hilton Membership Application. Using the app creates a seamless transition between orders from the system to the service crew, decreasing the time spent on communicating back and forth between staff and customers.

Novotel Ambassador Seoul has implemented N-Bot to deliver basic items such as towels or slippers to customers as part of its initiative to reduce manpower and increase productivity. While the adoption of this technology may have had a few obstacles, this initiative has helped reduce workload and manpower deployment. The manager has reported that a high investment has been made to systemize the robot with the hotel routes. Additionally, the hotel has implemented an AI-based room control platform, GiGA Genie, by the mobile carrier KT Corp. The GiGA Genie provides a voice recognition system that integrates with the smart hotel system to facilitate convenient stays for the customers and to support the hotel staff by handling customer inquiries, including queries like the swimming pool closing time. This technology has helped improve overall efficiency and reduce the time needed to attend to these requests.

Embark on Consultancy Study to Identify Existing Gaps

Intercontinental Grand Seoul Parnas has embarked on a consultancy study with Kearney Consulting (2012), Boston Consulting Group (BCG) (2018), and Ernst & Young (2020) to analyze various

topics around productivity and sustainability. The study aims to improve F&B operation processes and identify productivity gaps. Furthermore, the team has looked into redesigning its operational processes by studying best practices adopted in other countries and hotels.

Inhibitors to Technology Adoption in Seoul

Across the hotels surveyed, hotel managers all stated that mobile-based applications have been critical tools in enticing customers in Seoul and increasing customer engagement. This is especially due to the high rates of mobile ownership in Seoul and the cultural emphasis on technology and internet connectivity. However, the integration of digital applications into hotel operations has brought to the fore new challenges since most hotels use proprietary applications which makes its integration into various systems and processes difficult. Even within hotel brands, a standardized application has been a difficult endeavor due to the differing operational considerations at different properties, where standardization would decrease application usability. Furthermore, such hotel applications have largely been tailored for use amongst members of hotel loyalty programs, with limited reach to new customers.

Hotels have also faced challenges when integrating technologies into operational processes. Some hotel managers stated that robots have had a limited deployment in hotels due to operational constraints. Robot cleaning machines are not skilled enough to detect obstacles. For instance, Novotel incorporated N-Bot to deliver simple items and amenities to guests, however, the robot faced challenges as it was unable to respond dynamically to obstacles within its path, resulting in a need for constant supervision. This continued to place a strain on manpower to correct service delivery, decreasing the robot's utility in spearheading productivity gains at the hotel. As such, new technology implementation may not be suitable for every hotel as it may incur further expenses if the robot or the system does not perform as intended, with maintenance and repair fees leading to additional costs.

Moreover, Novotel tried to implement technology in its F&B operation but faced challenges as the current technology does not have the technical adequacy to simulate different requirements or conditions. The robot is only able to provide standard cooking, but customers may have different preferences (e.g., medium steak or dairy-free products).

Government Support to Foster a Tourism-Leisure Society

Tourism and hospitality have been important sources of economic growth for Seoul, which remains a top tourist destination worldwide. However, many of the government's initiatives to help the industry have been demand-centric to attract tourist arrivals and boost occupancy in Seoul's hotels. As part of this approach, the government has concentrated on introducing tax rebates and exemptions for tourists to incentivize and promote spending. Much of the Korean Tourism Bureau's efforts have been centered on promoting the attractiveness of Seoul as a destination for travel, with hotels surveyed stating they have observed little government intervention within the industry itself.

Impact of COVID-19

As with many of the other cities in this study, the impact of COVID-19 has been devastating to the hotel industry in Seoul. Global travel restrictions have drastically reduced tourist arrivals into the city, driving hotel occupancy levels down. Hence, the lack of foreign tourists has forced hotels in

Seoul to pivot toward targeting domestic travel to mitigate the loss of revenue. As domestic travel continues to pick up, hotels such as the Hilton have started offering staycation packages and promotions to attract domestic tourists and increase revenue.

Further, hotels have had to change operational processes to cope with the new realities brought about by the pandemic. Even as many hotels are forced to shed their employees due to low profitability, productivity has been drastically hit, with hotels pivoting to a survival mindset whilst waiting for the pandemic's end. Some hotels such as the Hilton have allowed employees to take long-term breaks lasting up to six months due to a steep decline in sales throughout the city's lockdown periods. This creates another challenge: limited manpower presents an important challenge for hotels when business resumes.

Many hotels have also begun to focus on F&B as a core business, with food service delivery remaining a profitable revenue stream for them. As many South Koreans seek food deliveries amidst restrictions on public dining and concerns about crowd mingling due to the pandemic, food delivery services have been in demand across the city. Hence, hotels have started to regard F&B as a critical bridging revenue stream to cope with the limited profitability brought about by low hotel occupancy.

TOKYO

TABLE 269

INTERVIEW COUNT (TOKYO).

Count	Overall	Luxury	Upscale	Mid-tier	Budget
Quantitative	20	5	5	5	5
Qualitative	12*	5	4	2	0

* One hotel interview was initially confirmed but was later rescheduled.

Hotel Metrics

Efficiency Indicator: Revenue per Worker across Cities over Five Years

TABLE 270

OVERALL ANNUAL REVENUE PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	127,236	65,126	74,027	44,287	87,119	111,061	89,595
2016	128,963	64,640	73,126	45,593	87,412	106,414	94,468
2017	126,869	76,787	75,034	46,467	88,265	99,675	90,674
2018	145,839	81,480	82,080	48,416	84,057	99,987	90,240
2019	170,607	80,930	81,537	59,903	107,687	130,722	111,507
Average	139,903	73,793	77,161	48,933	90,908	109,572	95,297
Growth between 2015 and 2019	34%	24%	10%	35%	24%	18%	24%

Revenue per worker indicates revenue generated by each employee. Overall, Singapore, Tokyo, and Seoul have the highest revenue per worker. Between 2015 and 2018, revenue per worker spiked twice before taking a significant decrease of 45%. Many hotels in Tokyo place great emphasis on sales and revenue generation to sustain profitability with a high level of manpower deployed. The fluctuation of revenue per worker may be due to a boom in tourism from 2015 to 2018, followed by an increase in the number of hotels that may have caused incumbent hotels to lower their prices as a way to maintain their market share.

Revenue per Worker by Tier over Five Years

TABLE 271

ANNUAL REVENUE PER WORKER IN TOKYO (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	146,289	93,617	93,192	23,949
2016	155,975	103,351	91,807	23,874
2017	132,463	109,053	83,437	20,114

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	Luxury	Upscale	Mid-tier	Budget
2018	144,512	100,257	80,463	20,623
2019	148,264	122,972	95,068	35,397
Average	145,501	105,850	88,794	24,791
Growth between 2015 and 2019	1%	31%	2%	48%

Across the board, Tokyo has strong profitability indicators with luxury and upscale hotels emerging as the top tiers.

Hotel Industry Dynamics from 2015 to 2019

During the study period, steady growth took place in Tokyo's hotel industry with the city being one of the top tourist destinations in the Asia Pacific. Tourism growth, as seen in Table 272: Number of Inbound Tourists[12], has led to the opening of new upscale hotels in anticipation of more growth in the coming years.

However, Tokyo has a limited number of luxury hotels (n-30) as compared to other cities, such as Bangkok (n-80). The limited choices of luxury hotels may affect overall industry revenue as luxury hotels are priced higher than hotels in the other tiers.

TABLE 272

NUMBER OF INBOUND TOURISTS IN JAPAN.

	2015	2016	2017	2018	2019
Japan	11,900,000	13,100,000	13,800,000	14,240,000	15,180,000

Technological advancement and incorporation have impacted hotel pricing in Japan significantly. Traditionally, hotels have offered a flat rate per room, but many hotels now utilize forecasting tools and systems to estimate room costs. Such tools have allowed hotels to set their room rates according to seasons, months, weeks, or by days to generate profit. This demand-based pricing strategy is adopted from overseas hotels and the airline industry. In addition, taking reference from ARR across all cities, room rates in Tokyo are the highest as Tokyo is one of the most expensive cities in the world.

Labor Productivity Indicator: Value Add per Worker across Cities over Five Years

TABLE 273

OVERALL ANNUAL VALUE ADD PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	86,383	31,908	47,300	29,691	68,988	91,646	65,053
2016	87,357	34,061	47,555	32,296	70,304	87,340	65,207
2017	88,843	38,583	49,314	30,624	72,295	83,197	62,010

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[12] The number of Inbound Tourists justifies the growing tourism boom over the years. An overall increase in inbound tourists was seen from 2015 to 2016 and 2018 and 2019 with a year-on-year growth of 10% and 7%, respectively.

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	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2018	101,230	42,199	55,860	31,899	68,706	82,753	61,696
2019	114,555	38,111	55,370	37,792	86,961	103,824	73,775
Average	95,674	36,972	51,080	32,461	73,451	89,752	65,548
Growth between 2015 and 2019	33%	19%	17%	27%	26%	13%	13%

A strong correlation between revenue per worker and value-add per worker is seen where three cities, Singapore, Seoul, and Tokyo emerge with the highest average. In Tokyo, value-add per worker is at an average of USD65,548 from 2015 to 2019 with a slight growth of 13%. While high value-add per worker may signify a higher productivity level, this may not be the case for Tokyo.

Value Add per Worker by Tier over Five Years

TABLE 274

ANNUAL VALUE ADD PER WORKER IN TOKYO (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	115,989	65,594	61,022	13,113
2016	123,176	64,064	62,163	13,690
2017	102,227	67,310	57,163	11,413
2018	112,476	60,481	54,709	13,144
2019	108,629	73,564	64,990	24,613
Average	112,500	66,203	60,009	15,194
Growth between 2015 and 2019	-6%	12%	7%	88%

Productivity is Slow in Tokyo due to Cultural and Societal Resistance

In Tokyo, the luxury and upscale segments continue to see high value-add per worker.

While Tokyo is a well-developed city, productivity is significantly lower than in all other cities due to higher cultural and societal resistance to new technologies and modes of working, the lack of flexibility to streamline operations, and the deployment of manpower. Many local hotel managers do not see the need to introduce elements of technology or improve the hotel's overall productivity levels despite having an interest in using mobile apps or digitalizing crucial operations. The lack of interest to adopt technology and change from the traditional way of doing things has impeded the hotels' operational processes, especially for luxury and upscale hotels, with many of the franchise hotels falling under this segment. Expat hotel managers find it difficult to overcome cultural barriers and perception gaps. Hence, hotel operations in Tokyo will not be transformative and changes in productivity may be slower as compared to the other developed cities in this study.

Unique Culture in Tokyo Inhibits Productivity

Tokyo holds a unique position in the hospitality industry due to its preserved history and heritage. Hotels across tiers are looking to provide an experience to travelers that is rooted in their culture,

'omotenashi'. The term 'omotenashi' refers to not just providing outstanding service but providing hospitality that goes above and beyond a person's expectations. In addition, hotel services collaborate with travel agencies and supporting organizations to provide authentic experiences unique to Japanese culture. Thus, hotels are going the extra mile to provide a holistic guest experience that stretches beyond their hotel stay to integrate various parts of their travel experience.

With this unique tradition, hotels (regardless of tier) seek to provide the best hospitality services to each guest. For instance, front office processes may take longer as compared to other cities as each employee is assigned to arriving guests and must take them through the facilities and amenities to ensure that guests feel welcome and satisfied with their stay. The unique attention paid to Japanese tradition may impede productivity at hotels in Tokyo as compared to those in other APAC cities. However, Hilton Tokyo has spearheaded the Operational Efficiency Project to reduce the duration of its check-in process. Through this project, the hotel managed to reduce the initial check-in time from 20 minutes to two minutes.

Preservation of Heritage and Tradition Leads to Lower Productivity

Japan takes pride in preserving its heritage and traditions. As such, the nature of its culture has inhibited productivity as hotels are resistant to modernity. Across the board, people are still highly reluctant to adopt new technologies, and this is evident in their everyday lives. An estimated 90% of consumers still pay in cash, and there are no credit card systems implemented at smaller restaurants. Apart from their tradition, Japan is a homogenous society with high resistance to foreign concepts as they have built their technological systems. While there is a handful of Japanese who are keen on adopting foreign concepts, they still lack the intention to take charge and move forward with integrating their system with global standards. For example, all hotels in Tokyo studied have been instructed to streamline systems and operations, yet Hilton hotel managers expressed that it is relatively harder to standardize processes because the majority of hotels are still using Japanese-developed systems. Hence, productivity is restrained, even for franchised hotels, as many of the Japanese operators are not interested in standardizing procedures.

Lack of System Integration Leads to Slow Productivity Growth

As systems are not unified across operations at the individual hotel level, each department uses a different system, and there is no integration across functions or roles, leading to even slower productivity. The lack of automated processes (e.g., data entry remains a common administrative and accounting function) may hinder the creditability of data due to potential human error and falsification of data to inflate numbers.

Idle Manpower and Resource Wastage

Unlike companies in other cities, Japanese companies are bound by societal and legal constraints, making it difficult to fire underperforming employees. This results in expending on manpower to keep employees that do not generate value as efficiently as other employees. Expats taking on managerial roles expressed frustration about idle time and inefficient resources that slow productivity even more.

Lack of Qualified Employees

Hotel managers within the luxury segment report the lack of a qualified talent pool results in a less skillful workforce within the hotel industry. While on-the-job training is provided, hotel managers report that no institutes are available that provide hospitality degrees and skill sets to aspiring students who are keen on taking this path. The caliber of talent within Tokyo is vastly different

from that in the USA where there are prestigious hospitality schools such as Cornell University. Furthermore, across the board, hotel managers with overseas job experience tend to be highly sought-after for their competency. Many high-performing managers hold overseas experience. As such, the lack of competent hoteliers may mean that more investments and resources are needed for on-the-job training to equip new employees with the right skill sets.

Profitability Indicator: Gross Operating per Worker across Cities over Five Years

TABLE 275

OVERALL ANNUAL GROSS OPERATING PROFIT PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	54,683	32,865	26,842	28,735	75,197	69,297	55,102
2016	55,558	33,870	24,872	31,806	67,310	66,899	55,963
2017	57,888	37,464	26,069	30,461	68,655	65,001	56,293
2018	57,888	41,175	32,018	32,770	65,645	69,322	53,075
2019	66,816	38,827	32,084	39,372	90,316	84,729	66,175
Average	82,995	36,840	28,176	32,359	72,669	70,494	57,073
Growth between 2015 and 2019	22%	18%	20%	37%	20%	22%	20%

Gross operating profit per worker is measured as the profitability generated by each worker. A similar trend is seen among the well-developed cities of Singapore, Tokyo, and Hong Kong, which is higher profitability. As hotel managers focus on profitability as a key performance indicator, it is noted that such prioritization has led to a higher gross profit. In addition, the rate comparison is conducted through understanding demand and supply which enable hotels to gain better perspectives of their hotel rate, resulting in higher profitability margins.

Due to lower levels of productivity, many hotels have prioritized profitability as their key business objective and solution to address their higher operating costs.

Gross Operating Profit per Worker by Tier over Five Years (Tokyo)

TABLE 276

ANNUAL GROSS OPERATING PROFIT PER WORKER IN TOKYO (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	114,285	47,007	54,004	13,113
2016	121,751	46,342	55,523	13,690
2017	120,985	50,092	51,429	11,413
2018	110,640	44,136	47,325	13,144
2019	105,870	54,824	56,571	24,613
Average	114,707	48,480	52,970	15,194
Growth between 2015 and 2019	-7%	17%	5%	88%

In Tokyo, luxury and mid-tier hotels see the highest gross operating profit per worker due to their higher profit margin and lower operating cost.

Efficiency Indicator: Operating Cost per Worker across Cities Over Five Years

TABLE 277

OVERALL ANNUAL OPERATING COST PER WORKER (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	40,854	33,218	26,727	14,596	18,131	19,415	24,542
2016	41,607	30,579	25,570	13,297	17,108	19,074	29,261
2017	38,026	38,204	25,720	15,843	15,970	16,478	28,665
2018	44,609	39,281	26,220	16,517	15,351	17,234	28,545
2019	56,051	42,819	26,167	22,111	20,726	26,898	37,731
Average	44,229	36,820	26,081	16,473	17,457	19,820	29,749
Growth between 2015 and 2019	37%	29%	-2%	51%	14%	39%	54%

Tokyo has the highest operating cost per worker as compared to the other cities. The higher operating cost may be tied to the lower productivity level as the city still lacks the motivation to drive productivity. The lack of productivity drive has been explained in Section Labor Productivity Indicator: Value-add per Worker, and will be elaborated upon below.

Operating Cost per Worker by Tier over Five Years (Tokyo)

TABLE 278

ANNUAL OPERATING COST PER WORKER IN TOKYO (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	30,300	28,023	32,170	6,429
2016	32,799	39,287	29,644	6,210
2017	30,236	41,743	26,275	5,285
2018	32,036	39,776	25,754	4,583
2019	39,635	49,408	30,078	9,973
Average	33,001	39,647	28,784	6,496
Growth between 2015 and 2019	31%	76%	-7%	55%

As noted in the gross operating profit per worker section, the operating cost per worker is significantly lower in Tokyo's luxury and mid-tier segments.

Use of Communication Platforms is Considered More Challenging than Phone-based Communication

Hotels in Tokyo have high resistance to adopting new technologies as they value hospitality and face-to-face interaction above all else. Taking pointers from other cities, a majority of hotel managers unanimously agree that back-end operations such as online communication channels

(e.g., chatbots) help increase efficiency and human errors. Interestingly, hotel managers in Tokyo perceive that using such back-end technology requires supervision from hotel staff. They also believe that it may cause errors or oversight; hence, they prefer making requests by phone.

Robot Cleaning Machines may Not be as Efficient as Human Labor

With regards to new technologies such as robotic cleaning machines, hotel managers in the luxury tier report that while these robots can take on some cleaning work, they are unable to provide precise cleaning in narrow corners or on ceilings. As illustrated by Park Hyatt, human-performed cleaning tasks are highly valued and provide better outcomes. As such, they prefer using housekeeping employees who are more efficient and effective. On a side note, regarding housekeeping, it is observed that the majority of hotels outsource stewarding and housekeeping as manpower costs are relatively high in Tokyo. Outsourcing of housekeeping is considered cost-efficient as hotels pay on a per-completed room basis.

Automation Reduces Human Interaction

Human interaction is highly valued, especially in Japanese culture. The adoption of automation may affect the overall service quality, which may negatively impact overall customer satisfaction. According to the hotel manager's perception, tourists are more inclined towards face-to-face interaction as compared to automated technologies.

Japanese Mindset Resistant to Upskilling and Training

In Tokyo, 'Ikigai' is part of the Japanese culture where many people are satisfied with their current status in life. Hence, hotels in Tokyo face resistance to upgrading their employees' skills. Compared to other cities, the hotel industry in Tokyo is deemed to be labor-intensive. Many employees are not keen on improving their status quo or upgrading their skills due to their instilled beliefs. Moreover, many Japanese believe in perfecting their craftsmanship (Japanese sushi chefs are not keen on taking up or learning other cuisines). Thus, hotel managers with different backgrounds (expats) have reported the need to significantly downsize manpower and have employees take up more roles to streamline job roles and business operations.

Process-driven and Hierarchical Culture may Hinder Efficiency

Additionally, a hotel's hierarchical structure might inhibit new thinking and creativity in business processes. As observed across the qualitative interviews conducted in the study, Japan is a homogenous society with a lack of diversity in its talent pool. This factor has culminated in ineffective business processes. While many hotel managers express the need to be forward-thinking with productivity and innovation, some hotels have expressed that cultural obedience toward hierarchical structures can act as a double-edged sword, with proper management and cooperation being key ingredients to effective operations. Moreover, leadership is centralized. Key decisions are in the control of managers, rendering operational processes ineffective.

Tokyo is a process-driven city and hotels' internal processes have many steps before a task is completed (e.g., the completion of housekeeping requires the housekeeper to clean the room, followed by having the supervisor check for any amendments needed). Having a room listed as vacant requires stringent checks and controls before it becomes available to the customer. Unlike other cities where one housekeeper can manage eight rooms, the turnover rate of vacant rooms in Tokyo is much lower, with one housekeeper managing only four rooms. However, in the face of COVID-19, hotel chains in Tokyo are slowly incorporating new management strategies to promote cross-deployment.

In addition, the city has yet to deeply integrate technology into its systems, and international hotels are still trying to reduce the amount of paper used (e.g., Hilton Tokyo is still trying to encourage its employees to go paperless).

Segregation and Clearly-defined Roles Result in Labor-intensive Workforce

In Tokyo, job specifications are clearly defined, and employees are only required to complete their assigned tasks based on their designations. While role specification happens mostly across luxury hotels in other cities, job specifications are practiced commonly across luxury, upscale, and mid-tier hotels in Tokyo due to resistance to taking on multiple job duties. The lack of cross-functional deployment and task rotation has led to higher usage of manpower, resulting in lower productivity.

Profitability Indicator: Average Room Rate across Cities over Five Years

TABLE 279

OVERALL AVERAGE ROOM RATE (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	207	141	158	119	169	160	186
2016	202	136	154	125	178	164	230
2017	197	144	152	116	177	159	226
2018	193	149	145	131	194	154	255
2019	195	132	140	116	179	156	259
Average	199	140	150	121	179	159	231
Growth between 2015 and 2019	-6%	-7%	-12%	-3%	6%	-2%	39%

Average Room Rate by Tier over Five Years (Tokyo)

TABLE 280

AVERAGE ROOM RATE IN TOKYO (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	294	236	119	83
2016	364	320	119	91
2017	400	247	126	95
2018	425	334	131	97
2019	485	275	139	91
Average	394	283	127	91
Growth between 2015 and 2019	65%	17%	16%	9%

Tokyo has the highest ARR as compared to the other well-developed cities due to the higher costs of living and Japan's strong currency. In addition, Tokyo hotels peg ARR against occupancy rate, allowing hotels to make necessary adjustments across different seasons. Luxury hotels see a much higher ARR as compared to other tiers due to their esteemed positioning and incorporation of culture within the business model.

Profitability Indicator: Revenue per Available Night (RevPAR) across Cities Over Five Years

TABLE 281

OVERALL RevPAR (IN USD).

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	150	125	129	87	129	101	124
2016	149	107	128	90	131	110	141
2017	141	133	123	90	136	110	138
2018	146	122	114	98	165	107	164
2019	149	101	115	87	149	111	138
Average	147	118	122	90	142	108	141
Growth between 2015 and 2019	-1%	-19%	-11%	0%	16%	10%	12%

RevPAR by Tier over Five Years (Tokyo)

TABLE 282

RevPAR IN TOKYO (IN USD).

	Luxury	Upscale	Mid-tier	Budget
2015	182	170	67	74
2016	183	221	68	74
2017	212	174	68	74
2018	210	263	81	74
2019	196	193	84	74
Average	197	204	73	74
Growth between 2015 and 2019	8%	14%	26%	74%

Tokyo has a higher RevPAR in comparison to all other cities. As ARR is pegged against the overall occupancy rate, RevPAR varies across tiers because occupancy rates vary by season.

Utilization Indicator: Average Occupancy Rate across Cities over Five Years

TABLE 283

OVERALL AVERAGE OCCUPANCY RATE.

	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2015	85%	82%	71%	71%	81%	84%	83%
2016	86%	81%	72%	72%	85%	85%	82%
2017	84%	80%	71%	72%	86%	87%	83%

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	Singapore	Bangkok	Taipei	Kuala Lumpur	Hong Kong	Seoul	Tokyo
2018	87%	83%	71%	66%	86%	83%	84%
2019	87%	80%	71%	65%	79%	89%	85%
Average	86%	81%	71%	69%	83%	86%	84%
Growth between 2015 and 2019	2%	-2%	0%	-8%	-2%	6%	2%

Across all cities, Tokyo has a relatively high AOR as the city witnessed a tourism boom over the last five years as indicated in Hotel Industry Dynamics. The government's efforts and promotional work have also supported the increase in overseas travel by working closely with supporting organizations to promote Tokyo as the key destination hub. Moreover, Tokyo is known as a business hub, with many inbound business travelers and face-to-face meetings.

Average Occupancy Rate by Tier over Five Years (Tokyo)

TABLE 284

AVERAGE OCCUPANCY RATE IN TOKYO.

	Luxury	Upscale	Mid-tier	Budget
2015	100%	91%	68%	97%
2016	68%	89%	65%	97%
2017	78%	88%	61%	96%
2018	79%	90%	58%	96%
2019	78%	90%	64%	96%
Average	81%	90%	63%	96%
Growth between 2015 and 2019	-22%	-1%	-6%	-1%

As reported above, the high occupancy rate of hotels in Tokyo may affect the overall ARR and RevPAR pricing.

Perception of Productivity

Perception of productivity differs across tiers. Luxury hotels perceive productivity as providing quality stays to customers; retaining and attracting customer return rates; and ensuring business continuation. Similarly, amongst upscale and mid-tier hotels, productivity is perceived as minimizing costs and maximizing profits. Interestingly, across all hotel tiers, profitability has been expressed as the most important factor in productivity. The emphasis on profitability may be due to the lack of focus on productivity. As such, hotel managers value sales and revenue generation to mitigate the lack of productivity improvement.

Furthermore, in comparison to other cities, Tokyo's hotels, especially those in the luxury tier, have higher room rates. This may be due to the extra hospitality services provided as well as the need to maintain higher profit margins due to higher spending on human resources and additional processes.

Best Practices Adopted by Hotels

Despite high resistance towards technological advancement, there is a need for hotels to move according to the speed of technology adopted by society. At this moment, with technology gadgets such as mobile phones being widely adopted, hotels will have to implement technologies such as mobile apps to stay connected and relevant to their target customers.

Luxury and Upscale Hotels Leverage Back-end Operations to Support Overall Business Operations

The luxury hotel Okura Tokyo has adopted RateShopper and Channel Manager, an analytics tool used by hotels to automate their rate comparison process and allow easier and quicker pricing allocation. Park Hyatt has also integrated the hotel management system, Opera, to track and forecast customers, deploy manpower, and understand occupancy rates.

Palace Hotel has incorporated a customer relationship management tool as a way to understand its customer base and track employee performance. These back-end operations help hotels identify key customer groups, profile their behaviors and preferences, and devise useful marketing strategies to attract and entice them.

Similarly, across all cities, the Marriot Hotel has uniformly incorporated the Marriot mobile app to retain and attract loyal customers. This app allows customers to receive hotel updates on the latest hotel happenings and promotions.

Upscale and mid-tier hotels have incorporated technological tools to streamline processes and reduce operational costs. For instance, Oakwood Premier has introduced a clock-in and clock-out system to eliminate unnecessary overtime pay. Phone calls are powered by AI which manages all inquiries and connects callers to the right service staff. Courtyard Marriot has spearheaded the automation of check-in and check-out and payment processes to reduce time. Additionally, Marriot hotels have mobile apps to entice and keep members up-to-date on the latest hotel involvement and promotions.

Impact of COVID-19

Government Support to Ensure Business Continuity

In light of COVID-19, the government has released stimulus funding via incentives and discounts to consumers to grow domestic tourism. The Go-to-Campaign has supported many hotels through the difficult pandemic environment. However, some budget hotels may not be able to benefit as much as luxury, upscale, and mid-tier hotels as hotel guests are much more likely to choose hotels with wide-ranging amenities to compensate for the gaps in their traveling experiences.

Impact of COVID-19 Pushed Hotel Managers to be More Productive

While productivity has been low over the past five years, COVID-19 has become the catalyst of change for many hotels in Tokyo due to the need for business continuity in the current climate. The lack of tourists has hampered the overall hotel industry, leading to a lack of revenue and income for many hotels. As such, hotels have evolved by adopting cross-functional job rotation, upskilling employees to equip them with other skill sets to support drops in manpower, and redeploying job functions to maintain and reduce manpower costs.

In the past, communication was often done face-to-face. In light of COVID-19, hotel managers have adapted to the new environment by introducing online courses and training programs for their employees to reduce the risk of virus transmission.

Brand perception is extremely important, particularly for luxury hotels. As such, to maintain its positioning and reassure customers, Palace Hotel has worked on getting sanitation accreditation approval to give customers peace of mind when staying on its premises.

Hotels are facing a shortage of income from banquets and MICE events, said to be the most lucrative business segments for hotels. Hence, many hotels are toying with out-of-the-box ideas to reduce revenue loss. As Frost & Sullivan analyzed all business functions, F&B emerged as a crucial business unit to hotels, apart from guest stay, as it brings higher profit margins to the hotel. This is particularly so amongst luxury hotels that house Michelin-rated chefs to bring premium culinary experiences to guests. As such, to mitigate the loss of revenue from the F&B segment, Palace Hotels is providing quality ingredients and condiments through service delivery to customers during the lockdown to generate another revenue stream.

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LIST OF ABBREVIATIONS

ADR	Average Daily Rate
AI	Artificial Intelligence
AOR	Average Occupancy Rate
APO	Asian Productivity Organization
AR	Augmented Reality
ARR	Average Room Rate
ASQ	Alternative State Quarantine
CRM	Customer Resource Management
e2i	Employment and Employability Institution
ELA	Events Layout Automation
F&B	Food and Beverage
F2F	Face-to-Face
FO	Front Office
FTE	Full-time Equivalents
GDS	Global Distribution System
HK	Housekeeping
HTNG	Hotel Technology Next Generation
HVAC	Heating, Ventilation, and Air-conditioning
IoT	Internet of Things
KPI	Key Performance Indicators
MBS	Marina Bay Sands
ML	Machine Learning
NTUC	National Trade Union Congress
PIC	Productivity and Innovation Credit
RevPAR	Revenue per Available Room
RFID	Radio-frequency identification
RMS	Revenue Management Systems
RPA	Robotic Process Automation
SHA	Singapore Hotel Association
SKM	Surhanjaya Koperasi Malaysia
SOP	Standard Operating Procedures
STB	Singapore Tourism Board
TAT	Tourism Authority of Thailand
TCEB	Thailand Convention and Exhibition Bureau
TICA	Thailand Incentive and Convention Association
VR	Virtual Reality

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Hotel Productivity Benchmarking

An APO study across seven cities in Asia