

SATISFACTION COEFFICIENT (CS) AND HOTEL EFFICIENCY INDEX (HEI):

an integrated metric proposal linking guest satisfaction and profitability in hotel management

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ABSTRACT

Traditional Revenue Management metrics — RevPAR, GOPPAR and CPOR — describe the financial efficiency of a hospitality property but do not incorporate guest satisfaction as a calculation variable, allowing financially equivalent hotels to follow very different reputational sustainability paths. This paper presents two original metrics developed by the author from continuous consulting practice since 2003: the Satisfaction Coefficient (CS), a composite index that normalizes and weights Net Promoter Score, aggregated public review scores, and guest return rate; and the Hotel Efficiency Index (HEI), which multiplies the GOPPAR-to-CPOR ratio by CS, producing a single measure of operational efficiency adjusted for satisfaction. The paper describes the theoretical foundation of the metrics, their mathematical formulation, sample-validity criteria, and a numerical example applied to two hypothetical hotels with identical RevPAR, demonstrating how HEI reveals real efficiency differences that isolated metrics fail to show.

Keywords: Hotel management. Revenue Management. Guest satisfaction. Operational efficiency. Performance indicators.

RESUMO

As métricas tradicionais de Revenue Management — RevPAR, GOPPAR e CPOR — descrevem a eficiência financeira de um meio de hospedagem, mas não incorporam a satisfação do hóspede como variável de cálculo, permitindo que hotéis financeiramente equivalentes apresentem trajetórias de sustentabilidade reputacional muito distintas. Este artigo apresenta duas métricas autorais desenvolvidas pelo autor a partir de prática consultiva contínua desde 2003: o Coeficiente de Satisfação (CS) e o Índice de Eficiência Hoteleira (IEH), que multiplica a razão entre GOPPAR e CPOR pelo CS, produzindo uma medida única de eficiência operacional ajustada pela satisfação. O artigo descreve a fundamentação teórica das métricas, sua formulação matemática, os critérios de validade amostral e um exemplo numérico aplicado a dois hotéis hipotéticos com RevPAR idêntico.

Palavras-chave: Gestão hoteleira. Revenue Management. Satisfação do hóspede. Eficiência operacional. Indicadores de desempenho.

1 INTRODUCTION

Revenue Management entered hospitality in the 1980s, directly inspired by the model Robert Crandall developed at American Airlines in the late 1970s to manage the perishable inventory of airline seats (Cross, Higbie, & Cross, 2009). Bill Marriott, concerned at the time with declining profitability across his hotel chain, transposed the logic to the hotel room: an unsold room today is revenue lost permanently (Kimes, 1989). From this adaptation came RevPAR (Revenue per Available Room), a metric created by Sheryl E. Kimes and operationalized by STR as the standard comparison benchmark between properties of different sizes.

The problem is that RevPAR alone does not answer the question that matters most to a hotel investor: which operation is actually more efficient? Two hotels with inverse average daily rate and occupancy can produce identical RevPAR while presenting radically different cost structures and operational performance (Rushmore & Baum, 2004). International literature already recognizes this limitation by proposing GOPPAR (Gross Operating Profit per Available Room) as a more complete profitability measure, since it incorporates operating expenses into the calculation; recent bibliometric reviews confirm GOPPAR as a central financial-performance indicator alongside RevPAR and ROI, although typically studied in a fragmented manner (Arnejo & Sarsale, 2025).

None of these metrics, however, incorporates guest satisfaction as a calculation variable. The omission has practical consequences: a hotel can optimize revenue and cost in the short term at the expense of its own reputation, mortgaging future occupancy without this ever appearing in the current period's financial reports. This paper describes two metrics developed by the author over more than two decades of independent hotel consulting — the Satisfaction Coefficient (CS) and the Hotel Efficiency Index (HEI) — proposed precisely to close that gap, connecting operational profitability and guest satisfaction into a single reading of efficiency.

2 THEORETICAL FRAMEWORK

2.1 Revenue Management and the limits of RevPAR

Revenue Management formalizes, with statistical and technological support, an old commercial practice: adjusting price according to demand, timing, and customer profile — a behavior documented both in medieval Arab trade routes and in Brazilian open-air markets, where fresh early-morning produce costs more than midday surplus. Kimes (1989) systematized this logic for fixed-capacity services with perishable inventory, the foundation underlying RevPAR. Rushmore and Baum (2004) and subsequent hotel-finance literature acknowledge, however, that RevPAR measures revenue capture, not cost efficiency — hence the need to pair it with GOPPAR and CPOR (Cost per Occupied Room) for any complete managerial reading.

2.2 Guest satisfaction as a profitability variable

Heskett, Sasser and Schlesinger (1994), in formulating the Service-Profit Chain model in the Harvard Business Review, demonstrated that customer satisfaction and profitability are not parallel variables but links in the same causal chain: internal service quality generates employee satisfaction, which generates customer satisfaction, which in turn generates loyalty and revenue growth. Reichheld (2003) advanced this line of reasoning by proposing the Net Promoter Score — the single question "how likely are you to recommend this company?" — as a predictor of future repurchase and referral behavior, directly correlated with customer lifetime value. Applied to hospitality, the implication is direct: a dissatisfied guest does not return, speaks negatively in public, and raises the acquisition cost of the next guest, so that any Revenue Management metric that ignores satisfaction is, in practice, discounting future revenue to show a flattering result today.

2.3 Measuring reputation on public platforms

Online reputation management platforms — such as TrustYou and ReviewPro — consolidate ratings from multiple channels (Google, Booking.com, TripAdvisor) into aggregated indices, such as the Global Review Index, typically on a 0-to-100 scale. These systems confirm, at international scale, what services-marketing literature had already pointed to: publicly declared perception in reviews has a direct effect on third-party purchase decisions, distinguishing it from return rate, which measures behavior already realized rather than declared intention.

3 METHODOLOGY

This paper has a theoretical-applied nature and an exploratory character. The metrics described — CS and HEI — were developed by the author empirically, from comparative analysis of operational data of hospitality properties served by SN Hotelaria Consultoria Especializada between 2003 and 2026, and have been applied internally since then, with HEI in systematic use since 2022. The formulation presented here constitutes the first public disclosure of both metrics, previously restricted to consulting reports. To date, there has been no statistical regression validation of the weights assigned to the CS variables: the weighting adopted — 0.4 for normalized NPS, 0.4 for normalized Review Index, and 0.2 for normalized return rate — reflects business logic built on repeated field observation, and is presented as such, not as a statistically validated result. Empirical validation of the coefficients is indicated as a future research agenda in the concluding section.

4 PROPOSED METRICS

4.1 Satisfaction Coefficient (CS)

The Satisfaction Coefficient combines three data sources that a hospitality property already routinely produces, normalized to the same 0-to-1 scale and weighted according to their relevance for third-party purchase decisions and for the sustainability of reputation:

$$CS = (NPS'n \times 0.4) + (Review'n \times 0.4) + (Return'n \times 0.2)$$

Where $NPS'n = (NPS + 100) \div 200$, normalizing Reichheld's (2003) –100-to-+100 scale to the 0-to-1 interval; $Review'n$ is the aggregated index of public review platforms (Google, Booking, TripAdvisor) divided by the maximum value of the scale used; and $Return'n$ is the rate of repeat guests over total guests in the period, an indicator that is already on a 0-to-1 scale, being a proportion. Normalization is a necessary condition for the calculation: since NPS, review score, and return rate are born on different scales, summing raw values would let NPS dominate the result purely by scale magnitude, not by the weight actually intended.

The 0.4/0.4/0.2 weighting assigns greater weight to NPS and Review Index because they are public, declared perceptions capable of influencing the purchase decision of guests who have not yet experienced the property. Return rate receives a lower weight because it is the indicator most susceptible to distortion by variables unrelated to satisfaction — captive location, roadside hotels with no lodging alternative in the area, fixed corporate contracts, or

single-destination seasonality — factors that can artificially inflate repeat business even in a context of dissatisfaction.

To preserve statistical validity, a minimum sample threshold of 30 responses per measurement period is established; below this volume, it is recommended to replace the point estimate with a three-month moving average until the sample recovers.

4.2 Hotel Efficiency Index (HEI)

HEI multiplies the ratio between GOPPAR and CPOR — which expresses how much gross operating profit the hotel produces for each unit of operating cost per occupied room — by the Satisfaction Coefficient, producing a single efficiency measure adjusted for satisfaction:

HEI = (GOPPAR ÷ CPOR) × CS

The underlying logic is that profitability unaccompanied by satisfaction does not constitute sustainable efficiency: it represents, at the limit, consumption of the reputational asset to sustain a short-term result. By treating CS as a multiplier — rather than a post-stay survey indicator filed away separately — HEI penalizes hotels that optimize cost and revenue at the expense of guest experience, and highlights hotels that sustain competitive profitability even while operating at high occupancy with less operational slack.

5 NUMERICAL APPLICATION

To illustrate the joint application of the metrics, consider a didactic example with two hypothetical hotels, A and B, both with a RevPAR of US\$ 100.00 in the same period — Hotel A with an average daily rate of US\$ 200.00 and 50% occupancy; Hotel B with an average daily rate of US\$ 100.00 and 100% occupancy.

Hotel	RevPAR	CPOR	GOPPAR
A	US\$ 100.00	US\$ 50.00	US\$ 20.00
B	US\$ 100.00	US\$ 20.00	US\$ 25.00

Table 1. RevPAR, CPOR, and GOPPAR for Hotels A and B

Assuming the post-stay survey, public reviews, and return rate produce CS = 0.82 for Hotel A — a lower-occupancy operation with staff dedicated to a smaller volume of guests — and CS = 0.61 for Hotel B — an operation at full capacity, with the natural wear of service delivered under year-round full-house conditions — the HEI calculation results in:

$$\text{HEI Hotel A} = (20 \div 50) \times 0.82 = 0.40 \times 0.82 = 0.328$$

$$\text{HEI Hotel B} = (25 \div 20) \times 0.61 = 1.25 \times 0.61 = 0.7625$$

Despite identical RevPAR between the two hotels, Hotel B's HEI is more than double Hotel A's. The gap, invisible to RevPAR and only partially suggested by GOPPAR in isolation, only becomes evident once satisfaction enters the calculation as a multiplier: Hotel B converts its leaner cost structure into real efficiency even while operating with a lower CS; Hotel A, with a higher rate and higher declared satisfaction, still shows lower combined efficiency because it carries a proportionally heavier cost structure.

6 CONCLUDING REMARKS

The applied numerical example confirms this paper's central proposition: identical RevPAR does not imply equivalent operations, higher GOPPAR does not imply a healthier business, and profitability without satisfaction does not constitute efficiency — at best, it represents a temporary financial result sustained by consuming the hotel's reputational capital. The Satisfaction Coefficient and the Hotel Efficiency Index respond to this gap by integrating, into a single replicable metric, data that most hospitality properties already produce but rarely analyze together.

As a limitation, it is acknowledged that the CS weighting (0.4/0.4/0.2) constitutes business logic grounded in continuous consulting observation, not statistically validated regression on a large dataset. Public disclosure of the metrics, after years of restricted use among SN Hotelaria clients, opens precisely the possibility of future validation: subsequent research, using datasets from multiple hospitality properties across different market profiles, could statistically test the stability of the proposed weights, calibrate them by segment (resort, urban, roadside, corporate), and investigate HEI's robustness as a predictor of long-term sustainability. A longitudinal application of CS and HEI to a sample of independent Brazilian hotels, benchmarked against already-established indicators in the international hotel financial-performance literature, is proposed as a future research agenda. A comprehensive practical treatment of both metrics — including calculation walkthroughs, a tracking-spreadsheet template, and three case studies across different hotel segments (beach resort, urban business hotel, and independent inn) — is available in Nogales (2026b).

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