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Menu Engineering for Competitive Advantage: Optimizing Sales Performance in Star-Rated Hotels in Bali

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Abstract

Background: While F&B outlets are recognized as critical revenue drivers, menu management has often been treated as an operational function rather than a strategic capability. Building on the Resource-Based View (RBV), the Service-Profit Chain (SPC), and Integrated Marketing Communication (IMC), this study reframes menus as dynamic revenue systems that integrate analytics, customer voice, and design interventions.

Objective: This study examines the strategic roles of menu engineering, customer-driven menu analysis (CDMA), and food and beverage (F&B) revenue management in enhancing sales performance and competitive advantage among star-rated hotels in Bali.

Methods: Using purposive sampling, survey data were collected from 90 F&B managers, executive chefs, and operational supervisors across four- and five-star hotels in Ubud, Sanur, and Jimbaran. Reliability and validity tests confirmed the robustness of the measurement instruments, and multiple regression analysis was employed to test the hypothesized relationships.

Results: The findings indicate that menu engineering significantly improves sales performance ($\beta = 0.612, p < 0.001, R^2 = 0.374$). Customer-driven menu analysis (CDMA) enhances competitive advantage through guest-driven menu design ($\beta = 0.547, p < 0.001, R^2 = 0.312$), while F&B revenue management practices including pricing strategies, bundling, and provenance storytelling further strengthen financial performance ($\beta = 0.593, p < 0.001, R^2 = 0.352$).

Conclusion: The results highlight menu management as a low-capex, high-impact strategic lever for achieving competitive differentiation. Segment-specific insights reveal that Ubud's wellness market favors sustainable menus, Sanur's family segment responds positively to bundled offerings, and Jimbaran's luxury market prioritizes provenance-driven seafood selections.

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INTRODUCTION

Competing for on-premise food-and-beverage (F&B) revenue has become pivotal for hotels in destination markets (Mun et al., 2022), such as Bali, where room yields are increasingly exposed to platform intermediation, rate-parity pressures, and demand volatility (Balkaya et al., 2023). In this context, menu engineering the systematic analysis of item-level popularity, contribution margins, and menu presentation offers a controllable lever for competitive advantage in hotel restaurants. Recent hospitality research underscores that subtle design choices in menu descriptions and language measurably influence consumers' expectations and selections, thereby affecting the sales mix and profitability at the outlet level (e.g., lexical richness and concrete wording increase item uptake) (Behnke et al., 2024). These findings, when translated from stand-alone restaurants to hotel outlets, suggest untapped potential to reallocate demand toward strategically important, higher-margin items an imperative for resorts facing rising input costs and the uneven post-pandemic recovery of international market segments.

Yet, despite sustained practitioner interest, three interrelated gaps remain. First, empirical menu engineering studies often evaluate single properties or individual restaurants (Mutlu et al., 2022; Noone & Cachia, 2020), limiting external validity for destination-level hotel portfolios. Second, much of the existing evidence focuses on micro-level design features (e.g., wording and typography) or profitability diagnostics (Cao et al., 2025), with fewer studies examining how menu redesign translates into outlet-level sales performance under real-world competitive conditions. Third, limited scholarship integrates multi-site hotel contexts to examine whether menu optimization effects remain consistent across heterogeneous demand ecologies, such as wellness-oriented Ubud, heritage and coastal Sanur, and premium-resort Jimbaran. Addressing these gaps is essential because F&B revenue is not merely ancillary; changes in the operational configuration between rooms and F&B materially influence hotel productivity (Kim & Lin, 2024), while restaurant concept salience and perceived coolness demonstrably shape patronage intentions in competitive dining markets (Barbosa Escobar et al., 2025).

Against this backdrop, we pose the following research question: How can hotel restaurants in Bali translate menu engineering diagnostics into observable sales performance gains while controlling for locational and market-mix heterogeneity? Accordingly, this study aims to evaluate a structured menu engineering intervention that combines contribution-margin and popularity analyses with evidence-based menu description and placement strategies implemented across three star-rated hotel outlets in Ubud, Sanur, and Jimbaran. Specifically, we assess its impact on (a) item-level sales mix, (b) outlet revenue and average check, and (c) contribution margin at the menu-category level.

The urgency of this study arises from persistent cost inflation and shifting demand patterns, where integrating menu analytics into F&B management can help protect profit margins. Furthermore, digital platforms such as QR-code menus and data-driven digital menu boards have heightened the strategic importance of menu wording, structure, and design (Behnke et al., 2024). Conceptualizing menus as dynamic choice architectures enables hotels to optimize customer conversion and product mix with minimal capital investment.

The novelty of this study lies in triangulating evidence across three Balinese micro-markets (Ubud, Sanur, and Jimbaran) to strengthen external validity while integrating customer-voice analytics into menu engineering, thereby establishing a customer-driven approach that extends traditional profitability mapping through lexical, structural, and visual experimentation (Demydyuk et al., 2024). Furthermore, we demonstrate how menu redesign can be aligned with broader revenue-management strategies, including pricing, bundling, and selective positioning, to actively shape guest choice patterns, enhance perceived value, and strengthen competitive differentiation. Empirical evidence indicates that revenue-management strategies, including non-pricing approaches such as bundling and experience-driven segmentation, significantly contribute to competitive performance in hotel settings (Moyeenudin et al., 2026; Nair, 2019).

This study contributes to hospitality revenue and operations management by connecting micro-level menu interventions with meso-level outlet performance in hotel settings. It

synthesizes insights from choice architecture and signaling theory to explain how lexical cues and menu layout function as signals of quality and distinctiveness while positioning the menu within the hotel's broader productivity frontier (Kim & Lin, 2024). Empirically, the multi-site design across Ubud, Sanur, and Jimbaran provides a robust test of how different market contexts shape menu engineering outcomes. The study also links profitability with sustainability by aligning menu items with waste-reducing compositions that simultaneously support financial performance and environmental objectives (Barbosa Escobar et al., 2025).

This study provides hotel managers with diagnostic tools for identifying margin-accretive menu items, context-specific design guidelines, and an iterative implementation framework for both print and digital menus. By reframing menus as dynamic revenue-generation systems, star-rated hotels in Bali can improve sales performance and strengthen competitive advantage without requiring substantial capital investment (Samson, 2024).

Menu engineering, traditionally classifying menu items into stars, plow-horses, puzzles, and dogs based on contribution margin and popularity (Enes & Koşan, 2023; Noone & Cachia, 2020), has become increasingly relevant for hotel restaurants as F&B operations play a larger role in overall hotel performance. Evidence demonstrates that F&B efficiency directly influences hotel competitiveness (Kim & Lin, 2024; Mun et al., 2022). Beyond serving as a static diagnostic tool, recent studies conceptualize menu engineering as a dynamic revenue-management instrument (Samson, 2024), aligning with the Resource-Based View (RBV) and Service-Profit Chain (SPC) perspectives, in which data-driven capabilities and strategic menu design constitute sources of sustainable competitive advantage.

Design elements such as wording, typography, and item placement significantly influence consumer perceptions and purchasing decisions. Meta-analytic evidence confirms that menu-design interventions shape customer attitudes, although their effects on actual purchasing behavior vary (Ip & Chark, 2023). Empirical studies further demonstrate that richer and more descriptive menu language enhances perceived value and trial intentions, while incorporating substitution effects into menu optimization generates superior revenue outcomes (Enes & Koşan, 2023; Noone & Cachia, 2020). Menus also function as brand-signaling devices; recent evidence indicates that perceived coolness and experiential attributes strongly influence customer loyalty and repeat patronage (Barbosa Escobar et al., 2025).

Customer-Driven Menu Analysis (CDMA) integrates transactional and customer-feedback data to optimize item placement and better align menu offerings with guest expectations (Demydyuk et al., 2024). This approach is particularly relevant in heterogeneous tourism destinations. In Bali, wellness-oriented visitors in Ubud tend to prefer sustainable dishes, families visiting Sanur prioritize variety and value, whereas luxury travelers in Jimbaran demand premium seafood offerings (Wang, 2025; Wen et al., 2024; Wu et al., 2024). Such market-specific tailoring enables hotels to align profitability objectives with the distinct preferences of different micro-markets.

Research on hotel revenue management increasingly emphasizes the strategic synergy between room operations and F&B services. Reallocating operational resources between these departments can significantly influence overall hotel performance (Kim & Lin, 2024), while restaurant research demonstrates that dynamic pricing, optimized menus, and food-waste reduction strategies simultaneously improve profitability and sustainability (Mehrotra et al., 2025). Consequently, effective menu management serves as a critical link between operational efficiency and strategic competitive positioning (Cozzio et al., 2018; Webb et al., 2023).

The Resource-Based View (RBV) posits that valuable, rare, inimitable, and organizationally embedded resources such as analytics-driven menu capabilities can generate sustainable competitive advantage (Barney, 1991; Mailani et al., 2024). The Service-Profit Chain (SPC) framework suggests that adaptive menu design enhances customer satisfaction and loyalty, thereby improving financial performance (Francis et al., 2026; Lambert et al., 2021; Martinez-Ruiz et al., 2023). Applied to the Balinese hotel context, the convergence of these theories highlights three complementary mechanisms: (1) menu engineering as a baseline classification framework (Enes & Koşan, 2023; Noone & Cachia, 2020); (2) Customer-Driven Menu Analysis (CDMA) as a mechanism for market-specific adaptation (Demydyuk et al., 2024);

and (3) F&B revenue management through strategic bundling and pricing to optimize contribution margins (Webb et al., 2023). Collectively, these mechanisms position menus as dynamic strategic systems that enhance sales performance while sustaining competitive advantage in global tourism markets.

Hypotheses Development

Menu Engineering and Sales Performance

Menu engineering, by aligning item popularity with contribution margins, demonstrably enhances both financial outcomes and guest satisfaction, as evidenced in Balinese hotel cases (Lai et al., 2019; Mutlu et al., 2022).

H_1**:** *Menu engineering has a positive effect on sales performance in star-rated hotels.*

Customer-Driven Menu Analysis and Competitive Advantage

Recent research emphasizes that customer feedback is important to incorporate into the menu cycle to capture dynamic market preferences (Wang, 2025; Zarezadeh et al., 2022). In Bali, such insights show wellness guests in Ubud prefer sustainable dishes, families in Sanur seek variety, and luxury travelers in Jimbaran value premium seafood. Integrating this feedback through CDMA enables hotels to align offerings with expectations and strengthen competitiveness.

H_2**:** *Customer-driven menu analysis has a positive effect on competitive advantage in star-rated hotels.*

F&B Revenue Management and Sales Performance

F&B revenue management extends beyond menu classification by operationalizing pricing, bundling, and promotional strategies to maximize revenue per guest (Kim & Lin, 2024; Webb et al., 2023). In highly competitive markets, such strategies have been shown to steer demand toward high-margin items and increase average check size. For Bali hotels, applying FBRM is expected to generate measurable improvements in sales performance.

H_3**:** *F&B revenue management has a positive effect on sales performance in star-rated hotels.*

Figure 1 visualizes how menu engineering, customer-driven menu analysis, and F&B revenue management converge to enhance sales performance and, ultimately, strengthen competitive positioning in star-rated hotels.

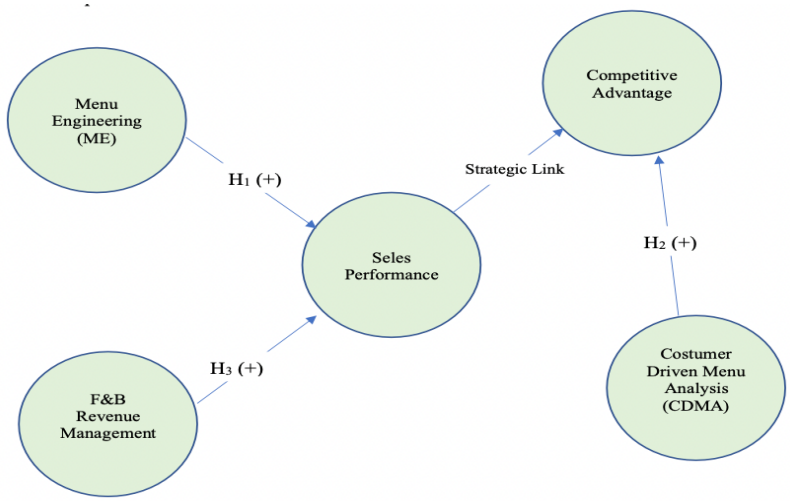

Figure 1. Conceptual framework depicting the hypothesized relationships among menu engineering, customer-driven menu analysis (CDMA), F&B revenue management, sales performance, and competitive advantage in star-rated hotels.

METHOD

Research Design

This study adopted a quantitative, cross-sectional, causal research design to examine the relationships among menu engineering, customer-driven menu analysis, food and beverage revenue management, sales performance, and competitive advantage in star-rated hotels in Bali. A cross-sectional design is widely applied in hospitality research for theory testing, particularly when investigating managerial practices and performance outcomes (Ali et al., 2021; Chinnaraju, 2025; Hair et al., 2021).

A total of 90 respondents were recruited, with approximately equal representation from each location. This approach ensured coverage across heterogeneous market segments while maintaining managerial relevance. The sample size of 90 is methodologically adequate for multiple linear regression with three predictor variables, as it exceeds the recommended threshold of 10–15 cases per predictor (i.e., a minimum of 30–45 respondents), as recommended by Hair et al. (2021). This sample size provides sufficient statistical power to detect medium-to-large effect sizes at the 0.05 significance level (Chinnaraju, 2025).

Primary data were collected using structured questionnaires distributed to hotel F&B departments, complemented by transactional data on menu sales where available. The questionnaire was developed based on validated scales from previous menu engineering and hospitality management studies (Kasavana & Smith, 1982; Miranti & Nugraha³ID, 2024; Noone & Cachia, 2020). Items were measured using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) to capture practices related to menu engineering, guest-driven analytics, revenue management, sales performance, and competitive advantage. Before the main survey, the instrument was pretested with five experts (two academics and three industry practitioners) to ensure clarity and contextual appropriateness, following recommendations for scale adaptation in hospitality research (DeVellis, 2017; Li et al., 2026). The measurement items for each construct are presented in Table 1.

Table 1

Measurement Items for Research Variables

Variable	Measurement Items (Indicators/Statements)	Source
Menu Engineering (ME)	1. Our menu items are regularly analyzed based on contribution margin and popularity. 2. We use menu classification (stars, plow-horses, puzzles, dogs) for decision-making. 3. Menu design elements (placement, wording, typography) are strategically adjusted to influence guest choices. 4. We redesign menus periodically to optimize sales mix and profitability.	(Kasavana & Smith, 1982; Noone & Cachia, 2020)
Customer-Driven Menu Analysis (CDMA)	1. Guest feedback is systematically collected and used to adjust menu offerings. 2. Transaction data (e.g., item-level sales) inform menu revisions. 3. We adapt menus to reflect different guest segments (e.g., wellness-focused, family, luxury travelers). 4. Customer preferences strongly influence our menu development cycle.	(Demydyuk et al., 2024; Wang, 2025; Zarezadeh et al., 2022)
F&B Revenue Management (FBRM)	1. We apply dynamic pricing strategies to maximize F&B revenue. 2. Bundling (e.g., set menus or combos) is used to enhance perceived value and sales. 3. Promotions and provenance narratives (e.g., highlighting local or premium ingredients) are part of our revenue strategy.	(Kimes, 2004; Nair, 2019; Webb et al., 2023)

Variable	Measurement Items (Indicators/Statements)	Source
	4. Revenue management practices guide decision-making in our F&B operations.	
Sales Performance (SP)	1. Our menu strategies improve item-level sales mix. 2. Average guest check size has increased due to menu interventions. 3. Menu redesign contributes to higher outlet revenue. 4. Contribution margins have improved through menu management.	(Lai et al., 2019; Mutlu et al., 2022)
Competitive Advantage (CA)	1. Our menu differentiates us from competitors in the market. 2. Menu strategies strengthen guest loyalty and repeat patronage. 3. Integrating customer preferences into menus enhances our market competitiveness. 4. Menu management supports our long-term brand positioning.	(Barney, 1991; Cozzio et al., 2018; Martinez-Ruiz et al., 2023)

Construct validity was examined using Pearson's product–moment correlation**,** with item–total correlations exceeding the 0.30 threshold and significance at $p < 0.05$ (Coşkun & Demirel, 2010; Usta, 2023). Internal consistency reliability was assessed via Cronbach's alpha, with all constructs scoring above the 0.70 benchmark recommended by Joseph F. Hair Jr et al., (2021), indicating strong reliability (Cheah et al., 2026).

Data analysis was performed using SPSS 26. The procedure followed a two-step approach: (1**)** classical assumption tests (normality, multicollinearity, heteroscedasticity) to ensure model adequacy, and (2) linear regression analysis to estimate the hypothesized relationships. Regression is appropriate for testing direct effects among managerial practices and performance measures in hotel and restaurant research (Coşkun & Demirel, 2010; Usta, 2023). Statistical significance was evaluated at the 5% level ($p < 0.05$) using *t*-tests for individual predictors and *F*-tests for overall model fit. The explanatory power of models was assessed using coefficient of determination (R^2).

While multiple regression is appropriate for testing the direct hypothesized effects in this study, future research may consider employing Structural Equation Modeling (SEM or PLS-SEM) to simultaneously test the relationships between constructs and capture potential mediating or moderating effects within a single analytical framework.

RESULTS AND DISCUSSION

Results

Respondent Characteristics

A total of 90 respondents participated in the survey, consisting of food and beverage managers, executive chefs, and operational supervisors from four and five-star hotels located in Ubud, Sanur, and Jimbaran. Table 2. presents the demographic profile of respondents.

Table 2

Respondent Characteristics (n = 90)

Characteristic	Category	Frequency	Percentage
Location	Ubud (Fivelements Retreat)	30	33.3%
	Sanur (Prime Plaza Hotel)	30	33.3%
	Jimbaran (InterContinental)	30	33.3%
Position	F&B Manager	32	35.6%
	Executive Chef	28	31.1%
	Operational Supervisor	30	33.3%
Hotel Classification	Fivelements Retreat Bali – Five-star Wellness Resort	30	33.3%

Characteristic	Category	Frequency	Percentage
	Prime Plaza Hotel Sanur – Four-star Hotel	30	33.3%
	InterContinental Bali Resort – Five-star Luxury Resort	30	33.3%
Experience in F&B	< 5 years	25	27.8%
	5–10 years	38	42.2%
	> 10 years	27	30.0%

The distribution indicates balanced representation across the three tourism micro-markets (Ubud, Sanur, Jimbaran), with an even spread across managerial roles. This enhances the representativeness of the sample for decision-makers in hotel F&B operations.

Application of Menu Engineering

The application of menu engineering was analyzed across the three research sites. Each hotel represents distinct market segments wellness tourism in Ubud, family-oriented travelers in Sanur, and luxury-seeking guests in Jimbaran. The distribution of menu items into the four classical engineering categories (*Stars, Plow Horses, Puzzles, Dogs*) is presented in Table 3.

Table 3
Distribution of Menu Items by Menu Engineering Category Across Three Hotels

Hotel / Location	Stars (High Margin – High Popularity)	Plow Horses (Low Margin – High Popularity)	Puzzles (High Margin – Low Popularity)	Dogs (Low Margin – Low Popularity)
Fivelements Retreat (Ubud) – 5★ Wellness Resort	Signature Plant-Based Tasting Menu, Raw Vegan Entrées	Herbal Detox Drinks	Exotic Fusion Bowls	High-calorie processed items
Prime Plaza Hotel (Sanur) – 4★ Family Hotel	Nasi Campur Bali, Family Set Menu	Seafood Fried Rice, Chicken Satay	Grilled Salmon with Dill Sauce	Rotational breakfast items
InterContinental Bali (Jimbaran) – 5★ Luxury Resort	Jimbaran Grilled Seafood Platter, Lobster Thermidor	Balinese Fish Soup	Imported Wagyu Steak	Vegetarian side dishes (low demand)

Integrated Findings Across Three Micro-Markets

The findings from the three case study locations Ubud (Fivelements Retreat), Sanur (Prime Plaza Hotel), and Jimbaran (InterContinental Bali Resort) demonstrate that while the principles of menu engineering are universally applicable, the strategies and outcomes vary considerably depending on the hotel classification, target market, and positioning strategy. To provide a clearer comparison across contexts, the integrated results are synthesized into a comparative summary. This table highlights the distribution of menu items by engineering categories (*Stars, Plow Horses, Puzzles, Dogs*), the dominant strategies applied, and the resulting impacts on guest perception and competitive advantage. To provide a clearer comparison across contexts, the integrated results are synthesized into a comparative summary (Table 4).

Table 4
Comparative Findings of Menu Engineering Application Across Three Hotel Contexts

Aspect	Ubud – Fivelements Retreat (Wellness, 5★)	Sanur – Prime Plaza Hotel (Family, 4★)	Jimbaran – InterContinental Bali Resort (Luxury, 5★)
Stars (High Popularity, High Margin)	Signature Plant-Based Tasting Menu; Raw Vegan Entrées	Nasi Campur Bali; Family Set Menu	Jimbaran Grilled Seafood Platter; Lobster Thermidor

Aspect	Ubud – Fivelements Retreat (Wellness, 5★)	Sanur – Prime Plaza Hotel (Family, 4★)	Jimbaran – InterContinental Bali Resort (Luxury, 5★)
Plow Horses (High Popularity, Low Margin)	Herbal Detox Drinks (bundled with spa/yoga packages)	Seafood Fried Rice; Chicken Satay (converted into family bundles)	Balinese Fish Soup (repositioned as premium appetizer with wine pairing)
Puzzles (High Margin, Low Popularity)	Exotic Fusion Bowls (tested via limited promotions)	Grilled Salmon with Dill Sauce (repositioned with "local provenance" narrative)	Imported Wagyu Steak (repositioned in wine-pairing promotions)
Dogs (Low Popularity, Low Margin)	High-calorie processed items (removed and replaced with healthier alternatives)	Rotational buffet items with low demand (to minimize waste)	Vegetarian side dishes (rebranded as luxury plant-based fusion options)
Dominant Strategy Applied	Align menu with sustainability & wellness positioning; eliminate misfit items; bundle wellness beverages with spa packages	Emphasize value & variety through bundling (family meal packages) and rotating menus; enhance perceived value of popular low-margin items	Leverage provenance storytelling & premium positioning; elevate seafood authenticity; rebrand underperforming items into luxury offerings
Impact on Guest Perception	Reinforced brand as a holistic wellness destination; increased loyalty among health-conscious travelers	Enhanced perception of value-for-money; increased repeat patronage from family groups	Strengthened luxury dining image; increased willingness to pay and average check size
Key Outcome	Improved sustainability alignment + waste reduction	Conversion of popularity into profitability + family loyalty	Higher average check, exclusivity, and competitive advantage

This comparative analysis demonstrates that while menu engineering consistently improved sales performance and competitiveness across all three locations, the mechanisms varied by segment**:**

1) Ubud (Wellness market) → Prioritized alignment with holistic positioning**,** highlighting plant-based items as "stars" and eliminating non-sustainable items.
2) Sanur (Family market) → Focused on value-for-money bundling and rotational menus to manage costs and sustain family appeal.
3) Jimbaran (Luxury market) → Relied on storytelling and provenance of premium seafood**,** coupled with rebranding of underperforming items to enhance exclusivity.

Thus, menu engineering is shown to be a flexible strategic tool**,** adaptable to different hotel contexts and guest expectations, providing both operational efficiency and competitive differentiation.

Validity and Reliability

Prior to hypothesis testing, instrument validity and reliability were confirmed. All items demonstrated significant item–total correlations ($r > 0.30$, $p < 0.05$), establishing construct validity (Coşkun & Demirel, 2010; Usta, 2023). Cronbach's alpha values exceeded 0.70 across all constructs Menu Engineering (0.873), Customer-Driven Menu Analysis (0.861), F&B Revenue Management (0.889), Sales Performance (0.876), and Competitive Advantage (0.868) indicating strong internal consistency (Cheah et al., 2026; Hair et al., 2021).

Descriptive Statistics of Research Variables.

Table 5 shows the descriptive statistics for each construct (Menu Engineering, Customer-Driven Menu Analysis, F&B Revenue Management, Sales Performance, and Competitive Advantage).

Table 5

Descriptive Statistics of Variables (n = 90)

Variable	Min	Max	Mean	Std. Dev.	Cronbach's α
Menu Engineering (ME)	2.20	5.00	4.12	0.61	0.873
Customer-Driven Menu Analysis (CDMA)	2.00	5.00	4.08	0.64	0.861
F&B Revenue Management (FBRM)	2.40	5.00	4.15	0.58	0.889
Sales Performance (SP)	2.20	5.00	4.19	0.62	0.876
Competitive Advantage (CA)	2.40	5.00	4.22	0.60	0.868

Hypothesis Testing

Regression analyses (Table 6) were performed to examine the proposed direct effects. The models satisfied classical assumptions (normality, multicollinearity, heteroscedasticity), ensuring unbiased estimators

H_1: Menu Engineering → Sales Performance.

Results show a positive and significant effect of menu engineering on sales performance ($\beta = 0.612$, $t = 8.214$, $p < 0.001$). The model explains 37.4% of the variance in sales performance ($R^2 = 0.374$), suggesting that effective menu engineering substantially contributes to improving item sales and revenue mix management.

H_2: Customer-Driven Menu Analysis → Competitive Advantage.

CDMA significantly enhances competitive advantage ($\beta = 0.547$, $t = 7.892$, $p < 0.001$). The model explains 31.2% of the variance ($R^2 = 0.312$). This finding underscores the role of guest feedback integration and transaction-driven menu adaptation in differentiating hotel F&B offerings within Bali's competitive tourism market.

H_3: F&B Revenue Management → Sales Performance.

Revenue management practices, including pricing, bundling, and promotions, exert a significant effect on sales performance ($\beta = 0.593$, $t = 8.045$, $p < 0.001$). The model explains 35.2% of the variance ($R^2 = 0.352$), indicating that revenue-oriented interventions are a critical driver of F&B profitability in star-rated hotels.

Among the three predictors, menu engineering demonstrated the largest standardised effect on sales performance ($\beta = 0.612$), followed by F&B revenue management ($\beta = 0.593$), while CDMA showed the strongest effect on competitive advantage ($\beta = 0.547$). The relative contribution of each variable underscores that ME and FBRM are the primary direct drivers of financial performance, whereas CDMA operates primarily through competitive differentiation.

Table 6

Regression Results

Path	β (Standardized Coefficient)	*t*	*p*	R^2	Decision
H1: Menu Engineering → Sales Performance	0.612	8.214	<0.001	0.374	Supported
H2: CDMA → Competitive Advantage	0.547	7.892	<0.001	0.312	Supported
H3: F&B Revenue Management → Sales Performance	0.593	8.045	<0.001	0.352	Supported

Linking Quantitative Results with Field Evidence

The analysis confirmed all three hypotheses: Menu Engineering (ME) significantly improved Sales Performance ($\beta = 0.612$, $p < 0.001$), Customer-Driven Menu Analysis (CDMA) enhanced Competitive Advantage ($\beta = 0.547$, $p < 0.001$), and F&B Revenue Management (FBRM) strengthened Sales Performance ($\beta = 0.593$, $p < 0.001$). Field evidence illustrates these mechanisms. In Ubud, plant-based tasting menus consistently performed as "stars," validating ME's role in boosting profitability. In Sanur, family bundles such as *Nasi Campur Bali* supported repeat patronage, showing CDMA's impact on differentiation. In Jimbaran, seafood platters with provenance storytelling reinforced exclusivity, confirming CDMA's strategic role. Likewise, revenue management practices detox drink–spa bundles in Ubud, family meal promotions in Sanur, and premium seafood repositioning in Jimbaran demonstrated how structured pricing and bundling transform demand into profit. Together, these findings confirm that while ME, CDMA, and FBRM principles are universally effective, their operationalization must be context-specific. This triangulated evidence supports the proposed framework, positioning menu strategies as critical drivers of sales performance and competitive advantage in hospitality.

Discussion

The empirical findings confirm the hypothesized relationships and extend theoretical insights into menu management within star-rated hotels. Three key contributions emerge.

First, the positive and significant effect of menu engineering on sales performance reinforces the foundational premise of the Resource-Based View (RBV) that firm-specific practices constitute valuable and inimitable resources for achieving superior performance (Barney, 1991; Mailani et al., 2024). Menu engineering, through the systematic classification of menu items into Stars, Puzzles, Plow-horses, and Dogs, provides managers with analytical capabilities to optimize the menu mix and improve profitability (Cao et al., 2025; Kasavana & Smith, 1982). The present study confirms this logic within the context of Bali's tourism market, where localized consumer preferences shape sales outcomes. In Ubud, for example, wellness-oriented visitors demonstrated a willingness to pay for sustainable and plant-forward menu items, underscoring that menu engineering, when contextualized, can generate a significant positive impact on sales performance. Recent work by Behnke et al. (2024) further supports this finding by demonstrating that descriptive language in menu design enhances consumer engagement, thereby amplifying the revenue-generating potential of menu engineering.

Second, the evidence that Customer-Driven Menu Analysis (CDMA) significantly enhances competitive advantage strengthens the Service-Profit Chain (SPC) perspective, which posits that effective internal processes improve customer satisfaction and loyalty, ultimately leading to superior financial and market performance (Frazer et al., 2026; Kohlbacher & Gruenwald, 2011). By integrating customer feedback with transaction analysis, hotels can better align their menu offerings with guests' evolving expectations. In Sanur, where family travelers constitute a substantial market segment, visitors generally prioritize affordability and menu variety. CDMA enables managers to refine bundling strategies and encourage repeat patronage. This finding is consistent with Noone and Cachia (2020), who argued that the renewed application of menu analysis should incorporate customer complexity into choice architecture (Enes & Koşan, 2023). Furthermore, CDMA reflects the principles of Integrated Marketing Communication (IMC), with the menu functioning as a strategic communication touchpoint that reinforces the brand narrative (Keller & Swaminathan, 2020; Lane & Keller, 2023). The findings also align with recent systematic reviews of restaurant revenue management, which emphasize the importance of integrating the customer voice into adaptive menu practices (Malheiros et al., 2025).

Third, the significant effect of F&B revenue management on sales performance underscores the importance of pricing, bundling, and promotional strategies as core mechanisms for revenue maximization. This finding is consistent with the SPC framework, wherein operational excellence translates into superior financial outcomes. The present study extends the work of Kimes (2004) on restaurant revenue management by demonstrating that, within hotel settings, revenue management practices extend beyond seat inventory optimization

to encompass F&B menus as dynamic pricing systems (Malheiros et al., 2025). In Jimbaran, for instance, luxury-oriented visitors responded positively to provenance narratives and premium seafood pricing, indicating that revenue management strategies not only enhance sales performance but also strengthen competitive differentiation. Barbosa Escobar et al. (2025) further argued that perceived restaurant "coolness," communicated through menu design and experiential cues, directly influences consumer consideration and willingness to pay, thereby supporting the strategic role of revenue management beyond its purely financial functions.

Taken together, these findings integrate the RBV, SPC, and IMC perspectives by demonstrating that menus function simultaneously as strategic resources, drivers of customer satisfaction and competitive advantage, and brand communication tools. These results reinforce recent evidence that menus should be viewed as dynamic revenue systems rather than static artifacts (Kimes, 2004; Noone & Cachia, 2020; Webb et al., 2023).

From a practical perspective, the findings indicate that star-rated hotels in Bali can optimize sales performance and strengthen brand positioning through strategically designed menu interventions. From a theoretical perspective, the study advances the literature by positioning menu engineering within a broader strategic framework of competitive advantage.

It should be noted that the relationships observed in this study are situated within Bali's distinctive tourism ecosystem, characterized by a strong cultural identity, growing wellness tourism demand, and luxury resort positioning. Consequently, the magnitude and direction of these relationships may differ in hotel markets with different demand characteristics, such as urban business hotels, budget accommodation sectors, or destinations with less distinctive culinary identities. Future comparative studies across diverse destination types and market structures would strengthen the external validity and generalizability of these findings. [Author Response: Done revision]

Although the present findings are consistent with the majority of the menu engineering and revenue management literature, it is important to acknowledge that some studies have reported weaker or non-significant effects of menu design interventions on consumer behavior, particularly in contexts where price sensitivity outweighs the influence of menu design cues (Ip & Chark, 2023). These findings suggest that the effectiveness of menu engineering is contingent upon market segment characteristics and dining context, reinforcing the importance of context-specific implementation strategies.

CONCLUSION

Future research should employ longitudinal or experimental methods to establish causal relationships and assess the sustained impact of menu interventions over time. Comparative cross-destination analyses across diverse tourism markets (e.g., urban vs. resort, domestic vs. international) are recommended to test the generalizability of the findings. Experimental designs, such as A/B testing of menu configurations in controlled hotel settings, would provide stronger causal evidence. Additionally, the integration of sustainability narratives into menu engineering frameworks warrants dedicated investigation, particularly in markets where environmental consciousness increasingly shapes consumer choice. Mixed-methods approaches combining quantitative performance metrics with qualitative guest experience data may further enrich understanding of the mechanisms through which menu strategies create value.

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AUTHOR CONTRIBUTION STATEMENT

All authors contributed to the research process, including conceptualization, methodology, data collection, analysis, interpretation of findings, and manuscript preparation. The first author contributed to the development of the research framework and initial manuscript drafting, while the other authors contributed to data validation, critical review,

refinement of the manuscript, and supervision of the research process. All authors have reviewed and approved the final version of the manuscript.

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