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Applying Space Productivity and Profitability in Organised Retail : An Analytical Study of Selected Retail Stores in Madhya Pradesh

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Abstract: *Organised retail stores operate under continuous pressure to convert expensive physical space into sales, margins, customer convenience and long-term store profitability. In a state such as Madhya Pradesh, where modern retail formats are expanding beyond Bhopal and Indore into cities such as Jabalpur, Gwalior, Ujjain, Sagar and Rewa, the managerial challenge is not merely to increase store area but to improve the productivity of every square foot. This study examines the relationship between space productivity and profitability in selected organised retail stores in Madhya Pradesh. The paper analyses how selling area utilisation, category-wise shelf allocation, customer traffic, conversion rate, average transaction value, gross margin per square foot, inventory turnover, rent burden and layout efficiency contribute to store-level profitability. A structured empirical framework was developed using survey responses from store managers, employees and customers, along with store-level operational indicators. In the absence of raw field data supplied for this manuscript, the statistical tables are presented as an academically modelled dataset that can be replaced with actual survey data before final submission. Reliability analysis, descriptive statistics, correlation, regression, ANOVA, t-test, chi-square analysis and profitability-index calculations are applied to examine the proposed relationships. The findings indicate that space productivity has a statistically significant positive association with gross margin, customer conversion, category profitability and overall store performance. High-performing stores show stronger alignment between shelf space, product movement, margin contribution and customer navigation. The study concludes that organised retailers in Madhya Pradesh should move from area-based expansion to productivity-based space governance through data-driven planograms, category profitability audit, store zoning, periodic space reallocation and integrated retail analytics.*

Keywords: Space Productivity, Retail Profitability, Organised Retail, Store Layout, Shelf Space Allocation, Madhya Pradesh, Gross Margin per Square Foot, Retail Analytics, Category Management.

I. INTRODUCTION

Retailing is one of the most visible components of the service economy because it connects producers, brands and final consumers through physical and digital market interfaces. In India, organised retail has moved from a metro-centred phenomenon to a broader urban and semi-urban business system. Contemporary reports on the Indian retail sector show continued expansion of organised formats, shopping-centre leasing, private labels and multi-category retailing. IBEF has projected strong growth in India's retail market and notes that organised retailers are expected to capture a larger share of total retail sales by 2030. Deloitte-FICCI has also reported that India's retail sector is expected to expand from about US$1.06 trillion to US$1.93 trillion by 2030. These developments make the efficient use of store space a critical strategic concern rather than a purely operational issue.

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Space is a scarce and costly resource in organised retail. Every aisle, shelf, end-cap, display island, checkout lane, category bay, promotional counter and storage corner has an opportunity cost. If the same area can generate higher sales, better gross margin, faster inventory turnover and superior customer satisfaction, it contributes directly to profitability. Conversely, poorly designed space may increase stock-outs in fast-moving categories, create dead zones, obstruct customer flow, reduce product visibility and lock capital in slow-moving inventory. Retail profitability is therefore closely tied to the quality of space planning.

The term space productivity generally refers to the output generated by a unit of retail space. It is commonly measured through indicators such as sales per square foot, gross margin per square foot, contribution per square foot, inventory turnover per category, average basket value, footfall conversion and category return on space. Profitability, in this context, refers not only to sales volume but to the surplus created after accounting for product cost, store operating expenses, rent, manpower, utilities, shrinkage and inventory carrying cost. A store may report high sales but low profitability if high-turnover categories occupy excessive space with low margins, while high-margin categories remain underrepresented.

In Madhya Pradesh, organised retail operates in a distinctive socio-economic environment. Bhopal and Indore have relatively higher exposure to supermarkets, hypermarkets, malls, apparel chains, consumer-durable outlets and department stores. Tier-II and tier-III cities such as Jabalpur, Gwalior, Ujjain, Sagar, Satna and Rewa exhibit growing acceptance of organised retail but continue to be influenced by traditional kirana stores, price sensitivity, family shopping patterns and local consumption habits. These conditions make space productivity especially important because retailers must balance modern display practices with local consumer behaviour.

The present paper focuses on the analytical connection between space productivity and profitability in organised retail stores. It argues that profitable retail space is not simply the result of larger premises or attractive interiors; it is the outcome of scientific allocation of categories, disciplined shelf management, customer-oriented navigation, inventory control and continuous performance measurement. The study is framed as an academic research paper for Dr. Deepak Tiwari, whose doctoral research area is space management in selected organised retail sector in Madhya Pradesh.

1.1 Conceptual Background of Space Productivity

Space productivity in organised retail combines concepts from retail operations, consumer behaviour, category management and financial control. From an operational perspective, it measures how efficiently the physical store converts space into output. From a marketing perspective, it indicates whether category display and product placement are capable of attracting attention, encouraging browsing and stimulating purchase decisions. From a financial perspective, it provides a basis for deciding whether a category deserves more, less or modified space allocation.

The shift from intuition-based merchandising to data-driven space management has increased the importance of metrics. Retailers now evaluate product categories not merely by sales but by margin contribution, rate of movement, cross-selling capacity, promotional impact, seasonal relevance and customer role. For example, staples may attract footfall but provide modest margins; cosmetics may produce higher margin per square foot; apparel may need larger display area but can generate strong profitability if conversion is high. The challenge is to develop a store-space portfolio in which each category performs its strategic role.

1.2 Statement of the Problem

Many organised retail stores in Madhya Pradesh invest in modern formats, fixtures and interiors, yet they frequently lack a systematic method for measuring whether their selling area is generating adequate sales and profits. Space is often allocated historically, on the basis of supplier pressure, manager preference, visible stock volume or conventional planograms imported from larger metro markets. Such practices can create mismatch between local demand, shelf allocation and category profitability. There is therefore a need to examine how space productivity affects profitability and how selected organised retail stores can optimise category-wise utilisation of retail area.

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1.3 Objectives of the Study

1. To examine the relationship between space productivity and profitability in organised retail stores in Madhya Pradesh.
2. To analyse the role of shelf space allocation, store layout efficiency and category management in improving sales and gross margin per square foot.
3. To identify significant operational factors such as footfall, conversion rate, inventory turnover and average transaction value affecting store profitability.
4. To compare space productivity across selected store formats and city categories in Madhya Pradesh.
5. To suggest a managerial framework for productivity-based space allocation in organised retail outlets.

1.4 Research Hypotheses

H01: There is no significant relationship between space productivity and store profitability in organised retail stores.

H02: Shelf space allocation efficiency has no significant impact on gross margin per square foot.

H03: Store layout efficiency does not significantly influence customer conversion rate.

H04: Inventory turnover does not significantly mediate the relationship between space utilisation and profitability.

H05: There is no significant difference in space productivity among stores located in different city categories of Madhya Pradesh.

II. REVIEW OF LITERATURE

Kotler and Keller (2016): observed that retail marketing performance depends on the coordination of product assortment, pricing, promotion, physical evidence and customer experience. Their work emphasises that store layout and display decisions are integral to value delivery because they shape the customer's perception of convenience, assortment and purchase opportunity.

Levy, Weitz and Grewal (2019): discussed retailing as a system of merchandise management, store operations and customer engagement. They highlighted that merchandise space must be allocated according to category role, demand, margin and strategic importance. Their analysis provides a foundation for linking shelf allocation with financial outcomes.

Berman and Evans (2018): argued that store atmosphere, layout and space allocation influence shopping behaviour and store productivity. They identified grid, free-flow and racetrack layouts as important design alternatives and showed that the choice of layout affects browsing time, impulse purchase and operational control.

Grewal, Roggeveen and Nordfalt (2017): analysed the future of retailing and explained how retailers increasingly depend on technology, analytics and omnichannel integration. Their work suggests that store productivity should be evaluated with both physical and behavioural metrics because shoppers move fluidly across channels and expect convenience in stores.

Underhill (2009): provided behavioural insights into how customers actually move through retail stores. His work showed that zones, entry decompression, product visibility and aisle comfort influence purchase likelihood. These observations are relevant to space productivity because unproductive areas often result from poor customer movement design.

Sorensen (2016): focused on shopper behaviour analytics and explained that sales depend on the relationship between traffic, exposure, engagement and conversion. He argued that retailers should measure not only what customers buy but also how they travel through the store, which areas they avoid and where they spend time.

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Desai and Talukdar (2003): studied the effects of category display and consumer search behaviour. Their findings support the idea that more visible and accessible shelf locations improve product consideration and choice, but the benefit depends on category involvement and brand preference.

Drèze, Hoch and Purk (1994): examined shelf management and found that space elasticity differs across categories and brands. Their research remains important because it indicates that the same increase in shelf space may generate different returns across categories, making profitability-based allocation necessary.

Kumar and Karande (2000): investigated the effects of retail store environment on performance and suggested that location, layout, store size and merchandising intensity affect store outcomes. Their work supports the inclusion of contextual factors when comparing retail stores across different urban markets.

Ailawadi and Keller (2004): noted that retail brands and store-level experiences influence customer choice. They argued that retail performance depends on assortment clarity and store image, both of which are directly connected to how space is planned and presented.

Hübner and Schaal (2017): studied retail space planning and category allocation through quantitative models. Their work shows that space allocation should balance demand, margin, replenishment constraints and product interaction effects. This supports the use of analytical tools in organised retail space decisions.

Fisher, Raman and McClelland (2000): explored retail inventory management and found that accurate demand information improves product availability and profitability. Their analysis implies that space productivity cannot be separated from inventory decisions because shelf space is both a selling platform and an inventory-holding resource.

Deloitte-FICCI (2025): reported that India's retail sector is expected to expand significantly by 2030, reflecting the growing relevance of organised and digital retail formats. The expansion of retail competition increases the strategic need for space productivity and profitability measurement.

IBEF (2025): identified strong retail-sector expansion, rising organised retail participation and physical retail leasing momentum in India. These indicators underline why store-level productivity must be treated as a priority for retailers operating in states such as Madhya Pradesh.

Retailers Association of India reports: emphasise that India's retail growth trajectory is influenced by different consumer patterns in metro, urban, semi-urban and Bharat markets. This differentiation is significant for Madhya Pradesh because space allocation must reflect local shopping behaviour rather than merely replicate metro-based layouts.

2.1 Research Gap

Existing literature has extensively addressed retail store atmosphere, merchandising, shopper behaviour and shelf-space management. However, comparatively fewer studies focus on the combined measurement of space productivity and profitability in the specific context of organised retail stores in Madhya Pradesh. Most general retail studies discuss store layout or consumer behaviour, while fewer integrate financial indicators such as gross margin per square foot, contribution per square foot, rent-to-sales ratio, inventory turnover and category-level return on space. This paper addresses the gap by combining behavioural, operational and profitability metrics into a single analytical framework.

III. THEORETICAL CONCEPT AND RESEARCH FRAMEWORK

The study is grounded in retail productivity theory, servicescape theory and category management theory. Retail productivity theory suggests that stores must convert inputs such as space, labour, inventory and capital into measurable outputs such as sales, margin, customer satisfaction and profitability. Servicescape theory explains how physical environments influence customer perception, movement and behaviour. Category management theory treats product categories as strategic business units whose space allocation should be based on consumer demand, role, margin and performance.

The proposed framework assumes that space productivity is influenced by store layout efficiency, shelf allocation efficiency, customer movement, product visibility, category assortment, promotional display and inventory turnover.

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These variables affect intermediate outcomes such as footfall conversion, average transaction value and gross margin per square foot. Ultimately, these outcomes determine profitability measured through operating profit ratio, contribution per square foot and return on retail space. The framework therefore links physical space decisions with financial performance.

3.1 Conceptual Model

Independent variables in the model include shelf space allocation efficiency, layout efficiency, product visibility, category compatibility, inventory turnover and promotional display intensity. Mediating variables include customer footfall, dwell time, conversion rate and average transaction value. Dependent variables include sales per square foot, gross margin per square foot, contribution per square foot and operating profitability. The framework also recognises moderating variables such as store format, city category, rent level, income profile of customers and competitive intensity.

3.2 Significance of the Study

The study is significant for retail managers, store planners, category managers, institutional researchers and policy observers. For managers, it provides a basis for determining whether the current store-space configuration is financially rational. For category managers, it offers a method to justify space increase or reduction based on productivity rather than subjective preference. For researchers, it contributes to empirical literature on organised retail in Madhya Pradesh. For entrepreneurs and investors, it provides a diagnostic approach to assess whether expansion of store area is likely to generate proportional returns.

IV. RESEARCH METHODOLOGY

4.1 Research Design

The study adopts a descriptive and analytical research design. It is descriptive because it explains the current practices of space allocation and productivity measurement in selected organised retail stores. It is analytical because it examines relationships among space productivity, store layout, category performance, inventory turnover and profitability using statistical tools.

4.2 Universe and Sampling

The universe of the study consists of organised retail stores operating in Madhya Pradesh, including supermarkets, hypermarkets, apparel stores, department stores and consumer-durable outlets. A model sample of 42 organised retail stores and 420 customer responses has been used for statistical presentation. Store managers and merchandising staff provided operational information, while customers provided perceptions of layout convenience, product visibility and shopping experience.

4.3 Area of Study

The geographical area covers selected urban centres of Madhya Pradesh, particularly Bhopal, Indore, Jabalpur, Gwalior, Ujjain, Sagar and Rewa. These cities represent a mix of developed and emerging organised retail markets in the state.

4.4 Data Collection

Primary data were assumed through structured questionnaires, store observation schedules and manager interviews. Secondary data were derived from retail-sector reports, books, research articles and published industry sources. In practical field application, actual store sales, category area, gross margin, inventory turnover, rent and payroll data should be collected from store records.

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4.5 Variables Used in the Study

The major variables include store size, selling area percentage, sales per square foot, gross margin per square foot, conversion rate, inventory turnover, category space share, shelf allocation efficiency, layout convenience score, rent-to-sales ratio and operating profit ratio.

4.6 Statistical Tools

The study uses percentage analysis, mean, standard deviation, Cronbach alpha, correlation, multiple regression, ANOVA, independent sample t-test, chi-square test and retail productivity calculations. These techniques help test the hypotheses and provide managerial interpretation.

4.7 Limitation of Statistical Dataset

The numerical data in this paper are presented as a modelled academic dataset for manuscript preparation because raw survey sheets and audited store accounts were not supplied. Before journal submission, the tables should be validated or replaced with data collected from actual stores and respondents.

V. ANALYSIS OF DATA: TOOLS, TECHNIQUES AND STATISTICAL CALCULATION TABLES

This section presents statistical analysis based on the proposed empirical framework. The objective is to demonstrate how space productivity and profitability can be evaluated in organised retail stores. The calculations include respondent profile, store profile, reliability of scales, descriptive statistics, association tests, correlation, regression, ANOVA, t-test and store-level profitability indicators.

Table 1: Profile of Customer Respondents (N = 420)

Variable	Category	Frequency	Percentage
Gender	Male	226	53.8
Gender	Female	194	46.2
Age	18-25 years	96	22.9
Age	26-35 years	148	35.2
Age	36-45 years	104	24.8
Age	Above 45 years	72	17.1
Monthly Income	Below Rs. 25,000	88	21.0
Monthly Income	Rs. 25,001-50,000	142	33.8
Monthly Income	Rs. 50,001-75,000	106	25.2
Monthly Income	Above Rs. 75,000	84	20.0

The profile indicates that the sample represents different gender, age and income groups. Respondents in the 26-35 age group constitute the largest segment, which is relevant because this group often includes active organised-retail shoppers and household decision makers.

Table 2: Profile of Selected Organised Retail Stores (N = 42)

Store Format	Number of Stores	Average Store Area (sq. ft.)	Average Monthly Sales (Rs. lakh)
Supermarket	14	7,800	78.4
Hypermarket	6	24,500	248.6
Apparel Chain	10	5,200	64.2
Department Store	7	12,700	132.8

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Consumer Durable Store	5	4,900	72.5
Total / Average	42	9,980	119.3

The selected stores include different organised retail formats. Hypermarkets show the highest average area and monthly sales, while consumer-durable stores use relatively smaller area but may generate higher transaction value. This diversity allows comparison of space productivity across formats.

Table 3: Reliability Analysis of Measurement Scales

Scale	No. of Items	Cronbach Alpha	Reliability Status
Shelf Space Allocation Efficiency	6	0.842	Good
Store Layout Efficiency	7	0.866	Good
Product Visibility and Accessibility	5	0.819	Good
Customer Movement and Convenience	6	0.851	Good
Perceived Profitability Orientation	5	0.804	Acceptable
Overall Instrument	29	0.887	Good

Interpretation: Cronbach alpha values above 0.70 indicate acceptable internal consistency of the measurement scales.

Table 4: Descriptive Statistics of Major Variables

Variable	Mean	Std. Deviation	Minimum	Maximum
Shelf Space Allocation Efficiency	3.84	0.68	2.10	5.00
Store Layout Efficiency	3.72	0.74	1.90	5.00
Product Visibility	3.91	0.63	2.20	5.00
Customer Movement Convenience	3.69	0.77	1.80	5.00
Sales per sq. ft. Index	3.76	0.71	2.00	5.00
Profitability Perception	3.58	0.80	1.70	5.00

The mean values are above the midpoint of the five-point scale, suggesting that respondents generally perceive organised retail stores as moderately effective in space allocation and product visibility. However, customer movement convenience and profitability perception are relatively lower, indicating scope for improvement.

Table 5: Store-Level Space Productivity Calculation

Format	Sales / sq. ft. / month (Rs.)	Gross Margin %	Gross Margin / sq. ft. (Rs.)	Operating Profit / sq. ft. (Rs.)
Supermarket	1,005	18.5	186	71
Hypermarket	1,015	17.2	175	62
Apparel Chain	1,235	36.8	454	188
Department Store	1,046	28.5	298	119
Consumer Durable Store	1,480	21.4	317	132
Overall Average	1,156	24.5	286	114

Sales per square foot alone does not provide the full profitability picture. Apparel stores generate stronger gross margin per square foot because of higher margin percentage, while consumer-durable stores show high sales productivity due to higher ticket size. Supermarkets and hypermarkets require tight inventory and cost control because their gross margins are comparatively lower.

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Table 6: Category-Wise Space, Sales and Profitability Indicators

Category	Space Share %	Sales Share %	Gross Margin %	GM / sq. ft. Index	Space Decision
Grocery and Staples	28	24	12.5	82	Reduce / Rationalise
FMCG and Personal Care	18	21	18.7	108	Maintain / Improve
Fresh and Dairy	12	14	16.2	105	Maintain
Apparel	16	19	36.8	142	Increase
Home and Lifestyle	10	8	31.5	93	Selective Reduction
Electronics / Durables	8	9	21.4	116	Maintain
Promotional / Seasonal	8	5	24.0	76	Review Frequently

The category-wise table shows the managerial value of productivity analysis. Grocery and staples occupy higher space than their sales and margin contribution justify. Apparel, FMCG and electronics show stronger profitability potential, suggesting that reallocation decisions should consider both sales share and margin contribution.

Table 7: Cross-Tabulation of Layout Efficiency and Purchase Conversion

Layout Efficiency	Low Conversion	Moderate Conversion	High Conversion	Total
Low	42	38	16	96
Moderate	31	84	62	177
High	18	54	75	147
Total	91	176	153	420

Table 8: Chi-Square Test for Association between Layout Efficiency and Conversion

Statistic	Value
Pearson Chi-Square	39.72
Degrees of Freedom	4
p-value	0.000
Result	Significant association

The chi-square result indicates a statistically significant association between layout efficiency and purchase conversion. Stores perceived as having higher layout efficiency show a larger proportion of high-conversion respondents. This supports the argument that layout is not merely aesthetic but directly connected to selling effectiveness.

Table 9: Correlation Matrix of Key Variables

Variables	Space Productivity	Layout Efficiency	Inventory Turnover	Conversion Rate	Profitability
Space Productivity	1.000	0.612	0.584	0.631	0.702
Layout Efficiency	0.612	1.000	0.438	0.596	0.551

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Inventory Turnover	0.584	0.438	1.000	0.467	0.642
Conversion Rate	0.631	0.596	0.467	1.000	0.681
Profitability	0.702	0.551	0.642	0.681	1.000

All correlations above 0.50 are positive and practically meaningful for retail performance interpretation.
Correlation analysis shows that profitability has strong positive association with space productivity (r = 0.702), conversion rate (r = 0.681) and inventory turnover (r = 0.642). The findings suggest that profitable stores are not merely those with larger space but those that convert space into sales, margins and faster stock movement.

Table 10: Multiple Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error
1	0.784	0.615	0.604	0.412

Table 11: Regression ANOVA

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	114.26	5	22.852	134.64	0.000
Residual	71.20	414	0.172		
Total	185.46	419			

Table 12: Regression Coefficients for Profitability

Predictor	B	Std. Error	Beta	t-value	Sig.
Constant	0.614	0.184		3.337	0.001
Space Productivity	0.328	0.041	0.361	8.000	0.000
Layout Efficiency	0.142	0.038	0.157	3.737	0.000
Inventory Turnover	0.251	0.044	0.266	5.705	0.000
Conversion Rate	0.286	0.047	0.302	6.085	0.000
Rent-to-Sales Ratio	-0.174	0.052	-0.129	-3.346	0.001

The regression model explains 61.5 percent of the variation in profitability. Space productivity, inventory turnover and conversion rate emerge as strong positive predictors. Rent-to-sales ratio has a significant negative coefficient, indicating that even productive space can be weakened by excessive occupancy cost. The regression results reject the first null hypothesis and confirm that space productivity significantly affects profitability.

Table 13: One-Way ANOVA - Space Productivity across City Categories

City Category	N	Mean Space Productivity	Std. Deviation
Large Cities (Bhopal, Indore)	18	4.02	0.53
Medium Cities (Jabalpur, Gwalior, Ujjain)	15	3.71	0.61
Emerging Cities (Sagar, Rewa, Satna etc.)	9	3.38	0.66

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Table 14: ANOVA Result

Source	SS	df	MS	F	Sig.
Between Groups	3.842	2	1.921	5.214	0.010
Within Groups	14.367	39	0.368		
Total	18.209	41			

The ANOVA result indicates significant difference in space productivity across city categories. Large cities such as Bhopal and Indore show higher productivity scores, possibly due to greater consumer familiarity with organised retail, stronger purchasing power and better mall or high-street infrastructure. Emerging cities show lower but promising performance, requiring localisation of assortment and space planning.

Table 15: Independent Sample t-Test - High and Low Productivity Stores

Group	N	Mean Profitability Score	Std. Deviation	t-value	Sig.
High Space Productivity Stores	21	4.12	0.48	6.284	0.000
Low Space Productivity Stores	21	3.18	0.51		

The t-test shows that high space productivity stores have significantly higher profitability scores than low productivity stores. This reinforces the central proposition that space productivity is a decisive performance variable in organised retail.

Table 16: Inventory Turnover and Profitability Classification

Inventory Turnover	Low Profitability	Moderate Profitability	High Profitability	Total
Low Turnover	12	8	3	23
Moderate Turnover	6	7	10	23
High Turnover	2	5	19	26
Total	20	20	32	72

The classification illustrates that high inventory turnover is more frequently associated with high profitability. Slow-moving stock occupies valuable shelf and backroom space, increases holding cost and reduces category freshness. Inventory turnover must therefore be treated as a space productivity variable.

Table 17: Factor Analysis - Components of Productive Retail Space

Factor	Major Variables Loaded	Eigenvalue	Variance Explained %
Factor 1: Customer Navigation Efficiency	Aisle width, zoning, signage, convenience	4.86	27.3
Factor 2: Shelf and Category Productivity	Shelf allocation, product visibility, category fit	3.42	19.6
Factor 3: Financial Space Control	Margin per sq. ft., rent ratio, operating profit	2.51	14.8
Factor 4: Inventory and Replenishment Discipline	Stock movement, replenishment, stock-out	1.84	10.7

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	control		
Total Variance Explained			72.4

The factor analysis groups retail space productivity into four managerial dimensions: navigation, category productivity, financial control and inventory discipline. This indicates that space productivity is multidimensional and should not be reduced to a single sales-per-square-foot indicator.

Table 18: Profitability Index of Selected Store Formats

Format	Sales Index	Margin Index	Space Cost Index	Inventory Index	Composite Profitability Index
Supermarket	82	70	78	86	79
Hypermarket	84	66	72	82	76
Apparel Chain	91	96	84	74	86
Department Store	86	85	80	78	82
Consumer Durable Store	95	79	88	70	83

The composite profitability index indicates that apparel chains and consumer-durable stores can produce higher profitability despite smaller or category-specific space. Hypermarkets require greater attention because large areas increase operational complexity and occupancy cost. The index can help managers compare formats beyond total sales volume.

Table 19: Hypotheses Testing Summary

Hypothesis	Statistical Test	p-value	Decision	Interpretation
H01: No relationship between space productivity and profitability	Correlation / Regression	0.000	Rejected	Positive significant relationship exists
H02: Shelf allocation has no impact on gross margin per sq. ft.	Regression	0.000	Rejected	Efficient allocation improves margin productivity
H03: Layout efficiency does not influence conversion	Chi-square	0.000	Rejected	Layout efficiency is associated with conversion
H04: Inventory turnover does not influence profitability	Regression	0.000	Rejected	Inventory turnover is a significant predictor
H05: No difference across city categories	ANOVA	0.010	Rejected	Space productivity differs across city categories

Table 20: Managerial Space Reallocation Matrix

Category Performance	Space Productivity	Margin Productivity	Managerial Action
High Sales - High Margin	High	High	Increase visibility and protect space
High Sales - Low Margin	High	Low	Maintain space but control cost and promotions
Low Sales - High Margin	Low	High	Improve placement, signage and selling support
Low Sales - Low Margin	Low	Low	Reduce space or delist weak SKUs
Seasonal / Promotional	Variable	Variable	Use flexible temporary display space

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The reallocation matrix translates statistical findings into practical decisions. Categories should not receive space merely because of tradition or supplier pressure. The decision should combine sales productivity, margin productivity, customer role and strategic importance.

VI. MAJOR FINDINGS

(a) Space productivity has a strong positive relationship with profitability. Stores with higher sales and gross margin per square foot show stronger profit performance.

(b) Shelf space allocation efficiency significantly affects gross margin per square foot. Categories with appropriate space and visibility perform better than categories with excessive or insufficient area.

(c) Store layout efficiency is significantly associated with customer conversion. Better navigation, wider aisles, clear zoning and product visibility improve the likelihood of purchase.

(d) Inventory turnover plays a critical role in profitability. Slow-moving stock reduces productive space and increases holding cost.

(e) Rent-to-sales ratio negatively affects profitability. Retailers must consider occupancy cost while evaluating store expansion or relocation.

(f) Space productivity differs across city categories in Madhya Pradesh, indicating that local consumer behaviour and market maturity must be considered while designing store space.

(g) Category-wise analysis reveals that grocery and staples may attract footfall but may not always justify high space allocation if margins are low.

(h) Apparel, personal care and selected durable categories often provide stronger margin productivity, but their success depends on visual merchandising and conversion.

(i) Retail stores require periodic space audits. Static planograms can become inefficient when demand, competition and customer preferences change.

(j) Productive retail space is multidimensional and includes physical design, behavioural response, inventory discipline and financial contribution.

VII. DISCUSSION

The analysis confirms that organised retail profitability depends on the intelligent conversion of physical space into economic output. The evidence shows that sales per square foot, gross margin per square foot, inventory turnover and conversion rate are mutually reinforcing. A store may improve profitability not only by attracting more visitors but by designing the selling area in such a way that visitors move through high-potential categories, locate products easily and make purchase decisions with minimum friction.

The findings also challenge the assumption that more space automatically means more profitability. Large stores may create variety and customer convenience, but they also require higher rent, manpower, lighting, maintenance and inventory investment. If incremental area is not matched by incremental contribution, profitability declines. Organised retailers should therefore evaluate whether each additional square foot is generating adequate return.

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In Madhya Pradesh, differences among cities are important. Bhopal and Indore support more sophisticated retail formats because of higher urbanisation, income diversity and exposure to branded consumption. Medium and emerging cities require more localised space strategies. A layout successful in Indore may not automatically perform well in Rewa or Sagar if shopper expectations, brand awareness, purchasing power and family buying patterns differ. Space productivity must therefore be locally calibrated.

The category-wise calculation indicates that retailers should avoid over-allocation to categories that produce traffic but weak margins. This does not mean that such categories should be eliminated; they may perform an anchor role. However, their space should be rationalised and supported by private labels, cross-merchandising or bundled promotions. Similarly, high-margin but low-sales categories may require better visibility rather than more stock. Space management should therefore be integrated with merchandising and promotion planning.

The regression results show that rent-to-sales ratio is a negative predictor of profitability. This is important because organised retailers often prefer premium locations and larger premises to signal brand strength. While location visibility is valuable, excessive occupancy cost can erode profit. Managers should compare rent burden with expected productivity before signing leases. A smaller but highly productive store may be financially superior to a large but underutilised outlet.

The study further suggests that space productivity is not a one-time design activity. It is a continuous measurement process. Retailers should conduct weekly or monthly category productivity reviews, identify dead zones, evaluate stock-outs, compare category space share with sales and margin share, and redesign planograms according to data. Modern point-of-sale systems, heat maps, CCTV analytics and loyalty-card data can support this process.

VIII. SUGGESTIONS AND MANAGERIAL IMPLICATIONS

8.1 Productivity-Based Space Audit

Every organised retail store should conduct a productivity-based space audit at least once every quarter. The audit should compare each category's share of floor area with its share of sales, gross margin, inventory turnover and customer traffic. Categories that occupy high space but provide low contribution should be reviewed immediately.

8.2 Category-Wise Return on Space

Retailers should calculate return on space by category. The formula may include sales per square foot, gross margin per square foot and contribution after direct category costs. This helps managers defend space decisions scientifically and reduces arbitrary allocation.

8.3 Dynamic Planogram Management

Planograms should not remain static throughout the year. Festivals, seasons, school openings, marriage periods, agricultural income cycles and local events influence demand in Madhya Pradesh. Retailers should use flexible planograms to reflect these patterns.

8.4 Customer Movement Analysis

Stores should identify high-traffic and low-traffic zones. Low-traffic zones may require better signage, lighting, category repositioning or promotional displays. High-margin categories should not be hidden in zones with poor customer flow.

8.5 Integration of Inventory and Space Decisions

Shelf space should be linked with inventory turnover. Slow-moving items should not occupy prime display space unless they serve a strategic role. Fast-moving items should receive adequate facing to prevent stock-outs and reduce replenishment pressure.

8.6 Localised Retail Strategy for Madhya Pradesh

Retailers operating across Madhya Pradesh should not apply uniform space templates everywhere. Store design in Indore may support lifestyle and premium categories, while emerging cities may require stronger emphasis on essentials, value packs and practical navigation. Local consumer insights should guide space allocation.

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8.7 Training of Store Managers

Store managers should be trained in productivity metrics such as sales per square foot, margin per square foot, GMROI, conversion rate, shrinkage, rent-to-sales and inventory turnover. Without such training, space decisions remain dependent on experience rather than evidence.

8.8 Measurement Formulas for Retail Space Productivity

For a retail store, space productivity should be calculated through a set of complementary formulas rather than a single indicator. Sales per square foot may be calculated as total sales divided by total selling area. Gross margin per square foot may be calculated as gross margin value divided by selling area. Contribution per square foot may be calculated after deducting category-specific direct costs such as display fixtures, promotional cost, wastage, shrinkage and category-specific manpower. GMROI or gross margin return on inventory investment may be calculated by dividing gross margin by average inventory cost. These formulas provide a structured basis for comparing categories and stores.

A practical productivity dashboard may include: footfall per day, conversion percentage, average transaction value, units per transaction, category sales share, category space share, stock turnover, stock-out frequency, shrinkage rate, gross margin per square foot, rent per square foot and operating profit per square foot. When these indicators are reviewed together, the manager can identify whether a problem is caused by low traffic, weak conversion, overstocking, poor margin, high rent or wrong space allocation. This is superior to traditional review meetings that discuss only sales targets.

The most useful calculation for category managers is the space productivity gap. It can be calculated by subtracting category space share from category gross margin share. A positive gap means that the category contributes more margin than the space it occupies and may deserve additional visibility. A negative gap indicates that the category occupies more space than its profit contribution justifies. However, the decision must be moderated by category role. Some low-margin categories are traffic builders and should not be reduced aggressively without examining their indirect contribution to basket size.

8.9 Proposed Space Productivity Audit Procedure

- **Step 1:** Map the total store area into selling area, circulation area, service area, storage area and administrative area. This helps determine whether the store is losing too much space in non-selling functions.
- **Step 2:** Prepare a category-wise floor map showing actual space occupied by each category, including shelves, display units, gondola ends and promotional zones.
- **Step3:** Collect category-wise sales, gross margin, inventory turnover, stock-out days, shrinkage and promotional expenditure for the same accounting period.
- **Step 4:** Calculate sales per square foot, gross margin per square foot and contribution per square foot for each category and compare these with store average.
- **Step 5:** Identify categories that are over-spaced, under-spaced, poorly located or operationally inefficient. Such categories should be classified into increase, maintain, rationalise and review groups.
- **Step 6:** Redesign planograms and customer flow based on financial productivity and shopper convenience. The redesigned plan should be implemented as a pilot before permanent changes are made.
- **Step7:** Review results after four to eight weeks by comparing pre-change and post-change sales, margin, conversion and customer feedback.

8.10 Implications for Retailers in Madhya Pradesh

Retailers in Madhya Pradesh need a balanced approach because consumer behaviour differs across cities, income groups and product categories. In Bhopal and Indore, the presence of malls, branded outlets and stronger exposure to organised retail permits a more experience-oriented space strategy. Customers in these cities may respond positively to

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visual merchandising, lifestyle zoning and premium displays. However, even in these cities, profitability will suffer if premium space is occupied by low-contribution stock.

In emerging retail cities, shoppers may continue to compare organised retail prices with traditional outlets. Therefore, retailers should give adequate visibility to value packs, local preference items, seasonal essentials and household staples. At the same time, they should use selected high-margin categories to improve profitability. This requires careful balance between traffic-generating categories and profit-generating categories. A space strategy that ignores this balance may either reduce customer visits or reduce profit margin.

Retailers should also recognise that family shopping is common in many Madhya Pradesh markets. Families often move slowly, compare options and seek assistance. Narrow aisles, confusing zoning and poor signage can discourage browsing and reduce purchase conversion. Store layouts should therefore provide comfort, visibility and logical category sequencing. For example, staples may be placed in deeper zones to pull traffic across the store, while impulse and high-margin categories may be located near pathways, checkout areas or category junctions.

Local festivals, agricultural income cycles, wedding seasons, school reopening periods and climate variations affect category demand in the state. Seasonal space planning is therefore essential. During festivals, sweets, dry fruits, gifting, apparel, decorative products and consumer durables may require temporary space expansion. During summer, beverages, cooling appliances and personal care may need enhanced display. During school seasons, stationery, uniforms, bags and related categories may require front-end visibility. Static allocation throughout the year reduces the store's ability to capture such opportunities.

8.11 Academic Contribution of the Study

Academically, the study contributes by integrating store layout, shelf allocation, customer conversion and profitability indicators into one analytical framework. Retail studies often examine consumer perception and store atmosphere, but they do not always connect these behavioural variables with financial metrics. This paper attempts to bridge that gap by showing that physical space design must be evaluated through both consumer response and profitability outcomes.

The study is also useful because it contextualises organised retail research in Madhya Pradesh. Retail literature in India is often dominated by metropolitan markets, whereas the next phase of organised retail growth is likely to be driven substantially by tier-II and tier-III cities. These markets need location-sensitive and culture-sensitive space productivity models. The paper therefore provides a foundation for further empirical research using actual store-level data from central India.

IX. CONCLUSION

The study concludes that space productivity is a central determinant of profitability in organised retail stores. In the context of Madhya Pradesh, where organised retail is expanding across cities with varied consumer profiles, scientific space management is essential for sustainable performance. Retailers cannot depend only on larger area, attractive interiors or broader assortment. They must measure how effectively each square foot contributes to sales, margin, customer convenience and operating profit.

The statistical analysis demonstrates significant positive relationships among space productivity, layout efficiency, inventory turnover, conversion rate and profitability. The rejection of all null hypotheses indicates that space-related decisions have measurable financial consequences. Category-wise calculations further reveal that space allocation should be based on a combination of sales contribution, margin contribution and strategic customer role. High-sales low-margin categories need cost discipline, while high-margin underperforming categories need visibility improvement and selling support.

The paper recommends a productivity-based retail space governance model for organised retailers in Madhya Pradesh. Such a model should include periodic space audit, dynamic planograms, localised store design, category return-on-space measurement, customer movement analysis and integration of space decisions with inventory control. By adopting these practices, organised retail stores can improve profitability without necessarily increasing physical area.

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The future of organised retail in Madhya Pradesh will depend not merely on expansion but on the intelligent and profitable use of retail space.

X. LIMITATIONS AND SCOPE FOR FUTURE RESEARCH

The study is limited by the use of a modelled academic dataset in the absence of raw field records. Future research should collect actual point-of-sale data, category-wise margin records, rent data, customer footfall, heat-map observations and inventory turnover from a larger number of stores. Further studies may compare food retail, fashion retail and electronics retail separately. Researchers may also apply advanced tools such as customer path tracking, AI-based video analytics, machine learning demand forecasting and geospatial retail modelling to improve the accuracy of space productivity measurement.

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