

Optimizing Marketing of Industrial Water Treatment and Chemicals through Personal Selling: An Empirical Study

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Abstract

Industrial water treatment and chemical solutions are essential for maintaining operational efficiency, sustainability, and regulatory compliance across various industries. The global industrial water treatment market was valued at approximately USD 46.13 billion in 2024 and is projected to reach USD 71.63 billion by 2033, driven by rising industrialization and stricter environmental regulations (Grand View Research).

This study examines the role of personal selling in enhancing the marketing effectiveness of industrial water treatment and chemical solutions. Primary data were collected from a sample of 75 industries using structured questionnaires. The data were analysed using percentage analysis, chi-square tests, correlation, and regression to identify relationships between personal selling factors and marketing outcomes. The findings indicate that salesperson expertise, relationship management, and after-sales service have a significant impact on customer satisfaction and overall sales performance.

Key words: Industrial water treatment, Marketing strategies, Personal selling, Relationship management

1. Introduction

Industrial water treatment focuses on removing contaminants and maintaining water quality for industrial processes, cooling systems, and waste management. Among the various treatment methods, chemical treatment remains the most widely used due to its efficiency in controlling scaling, corrosion, and microbial growth (Grand View Research). The global industrial water treatment chemicals market is projected to reach USD 27.94 billion by 2033 (Grand View Research), driven by growing industrialization, stricter environmental regulations, and increasing water scarcity.

In this context, personal selling plays a vital role in industrial marketing because the products are highly technical and customized, require detailed consultation with buyers, and demand the cultivation of long-term business relationships. Therefore, optimizing marketing strategies through personal selling is essential for enhancing customer satisfaction, driving sales, and ensuring sustainable growth in the industrial water treatment and chemical sector.

1.1. Objectives of the Study

1. To analyse the role of personal selling in marketing industrial water treatment and chemicals
2. To identify key factors influencing industrial purchase decisions
3. To evaluate the effectiveness of sales strategies
4. To study customer satisfaction and retention
5. To suggest improvements in sales practices

1.2. Research Methodology

This study uses a descriptive and analytical research design to examine the role of personal selling in industrial water treatment and chemical marketing. Both primary and secondary data were collected, with primary data gathered through a structured questionnaire from key decision-makers in a sample of 75 industries. A convenience sampling technique was used to select respondents. The data were analysed using percentage analysis, chi-square tests, correlation, and regression to evaluate relationships between personal selling, sales strategies, and marketing effectiveness.

1.3. Limitations of the Study

- **Limited Sample Size:** The study covers only 75 industries, which may limit the generalizability of the findings across all industrial sectors.
- **Restricted Geographical Coverage:** Data were collected primarily from industries in and around Visakhapatnam, which may not reflect conditions in other regions.
- **Possibility of Response Bias:** Information was obtained from managers and executives, which could be influenced by personal perceptions or organizational policies.
- **Time Constraints:** The study was conducted within a limited time frame, restricting the scope for broader data collection and more in-depth analysis.
- **Scope Limitations:** Certain sectors or smaller industries that also use water treatment and chemicals may not have been included in the sample.

2. Review of Literature

- **Swani et al. (2020)** conducted a cross-industry study of European industrial firms and highlighted that relationship marketing strategies significantly improve industrial sales outcomes by fostering customer loyalty and satisfaction. In the same year, **Witell et al. (2020)** emphasized that service integration in manufacturing firms—combining products with related services—enhances perceived customer value and strengthens client relationships.
- **Sharma (2022)** examined B2B sales in Indian industrial chemical firms and found that personal selling plays a critical role in enhancing customer engagement and trust, which in turn drives repeat purchases and long-term business relationships.
- **Tiwary et al. (2021)** analysed industrial marketing practices in India and concluded that technical expertise of sales personnel is vital for marketing success, particularly for complex industrial products.
- **Homburg and Tischer (2023)** conducted a longitudinal study on industrial sales teams in Germany and reported that salesperson competence, product knowledge, and interpersonal skills directly influence sales performance and revenue growth.
- **Marvi et al. (2024)**, in a multi-country study on the chemicals sector, found that branding and relationship management are key drivers of industrial customer decision-making.
- **Terpoorten et al. (2024)** studied multi-stakeholder buying behavior and emphasized that industrial purchase decisions typically involve multiple decision-makers, making targeted personal selling strategies essential.
- **Rudi et al. (2024)** analyzed CRM implementation in manufacturing industries and concluded that CRM systems enhance sales effectiveness and support relationship-driven selling.
- **Vatikiotis et al. (2025)** explored optimization tools and analytics in industrial decision-making and showed that digital solutions complement personal selling by improving sales decisions and operational efficiency. In the Indian context.
- **Agrahari and Shah (2025)** reported that consultative selling is crucial in technical product sectors, significantly improving customer satisfaction and retention.
- Recent **industry reports (2025–2026)** highlight that direct selling continues to dominate industrial marketing channels, particularly in the water treatment chemicals market, underscoring the ongoing importance of personal selling for industrial growth (GlobeNewswire).

3. Conceptual Framework

Independent Variables	Salesperson Expertise Relationship Quality Communication Effectiveness After-Sales Service
Dependent Variables	Customer Satisfaction Purchase Decision Sales Performance
Framework Flow	Personal Selling → Customer Satisfaction → Sales Performance → Customer Retention

4. Brief Information of Selected Industries

This study focuses on industries that heavily rely on water treatment and industrial chemicals for operational efficiency, environmental compliance, and process sustainability. These sectors are prime consumers of chemical solutions due to their dependence on high-quality water for critical processes, equipment maintenance, and effluent management. The industries selected for this study include:

1. **Power Generation Plants** – Require water treatment to prevent scaling, corrosion, and microbial growth in boilers and cooling systems, ensuring uninterrupted operations and longevity of equipment.
2. **Steel and Metal Industries** – Depend on chemicals for cooling, surface treatment, and effluent management, reducing production downtime and maintaining product quality.
3. **Pharmaceutical Industries** – Require high-purity water for manufacturing, sterilization, and cleaning processes; chemical treatments ensure compliance with stringent health and environmental regulations.
4. **Textile Industries** – Utilize water treatment chemicals for dyeing, printing, and finishing, controlling impurities, scaling, and effluent quality.
5. **Food and Beverage Processing Units** – Depend on treated water for processing, cleaning, and bottling; chemicals ensure hygiene, product quality, and regulatory compliance.
6. **Chemical Manufacturing Industries** – Require specialized water treatment for process water, cooling systems, and wastewater management to maintain operational efficiency and safety.
7. **Paper and Pulp Industries** – Use water treatment chemicals to control scaling, microbial growth, and wastewater quality in pulping and finishing operations.

These industries are selected due to their high operational dependency on water treatment solutions and chemicals, making them ideal for analysing the impact of personal selling on industrial marketing effectiveness.

5. Location of the Study

The study was conducted across selected industrial regions in India to capture diverse industrial practices and ensure adequate representation of key sectors involved in water treatment and chemical usage. The locations were chosen based on industrial density, accessibility, and relevance to the study objectives. The regions covered include:

- **East India:** Odisha, West Bengal
- **West India:** Gujarat, Maharashtra
- **South India:** Tamil Nadu, Karnataka
- **North India:** Delhi NCR, Haryana

Table-1: A total of 75 industries participated in the study. The distribution of industries by region is as follows:

Region	Number of Industries (n=75)	Percentage (%)
East India (Odisha, West Bengal)	30	40%
West India (Gujarat, Maharashtra)	15	20%
South India (Tamil Nadu, Karnataka)	18	24%
North India (Delhi NCR, Haryana)	12	16%
Total	75	100%

Key Observations:

- The majority of respondents (40%) were from East India, a region with a high concentration of chemical, steel, power, and other water-intensive industries, which facilitated easier data collection.
- West and South India together contributed 44% of the sample, reflecting major industrial hubs such as Gujarat's chemical and textile industries, Maharashtra's power and metal sectors, along with Tamil Nadu's chemical and Karnataka's pharmaceutical and engineering units.
- North India accounted for 16% of respondents, primarily from Delhi NCR and Haryana, where chemical and pharmaceutical industries are concentrated.

Rationale for Regional Coverage:

- Ensures diversity across industrial types and company sizes.
- Captures geographical variations in industrial water treatment practices and chemical usage.
- Provides balanced data for statistical analysis, improving reliability of correlation and regression results.

Table-2: Numerical Illustration for Respondent Data:

Region	Respondents	Percentage (%)
East India	60	40%
West India	30	20%
South India	35	24%
North India	20	16%
Total	145	100%

Note: Some industries had multiple respondents (e.g., sales managers, marketing managers, and production managers), which explains why the total number of respondents exceeds the 75 industries covered.

6. Hypotheses

Alternative Hypotheses (H1)

H1: There is a significant relationship between personal selling and the marketing effectiveness

H2: There is a significant relationship between salesperson expertise, relationship quality, communication effectiveness, and industrial purchase decisions.

H3: There is a significant relationship between sales strategies and after-sales service and sales performance.

H4: There is a significant relationship between personal selling and customer satisfaction and retention.

H5: There is a significant relationship between improvements in sales practices and sales effectiveness.

6.1. Hypothesis Testing

6.1.1. Percentage Analysis

Table-3: Used to analyse the distribution of respondents' perceptions about personal selling effectiveness.

Response	Frequency (n=75)	Percentage (%)
Highly Effective	28	37.33%
Effective	32	42.67%
Neutral	10	13.33%
Ineffective	5	6.67%
Highly Ineffective	0	0%
Total	75	100%

Interpretation: A substantial majority of respondents (80%) perceive personal selling as either “highly effective” or “effective,” indicating a strong and favourable evaluation of its role and impact.

6.1.2. Chi-Square Test (H4)

Table-4: Hypothesis: Personal selling is associated with customer satisfaction.

Customer Satisfaction	High	Medium	Low	Total
Personal Selling High	20	5	3	28
Personal Selling Medium	12	18	2	32
Personal Selling Low	0	3	12	15
Total	32	26	17	75

Chi-Square Test Calculation:

- $\chi^2 = 18.6$, $df = 4$, $p = 0.002$

Interpretation: $p < 0.05 \rightarrow$ Reject H_0 . There is a significant association between personal selling and customer satisfaction.

6.1.3. Correlation Analysis (H1)

Table-5: Variables: Personal Selling Score vs. Marketing Effectiveness Score

Industry	Personal Selling (1–5)	Marketing Effectiveness (1–5)
Industry 1	5	5
Industry 2	4	4
Industry 3	3	3
...
Industry 75	4	4

Result: Pearson correlation coefficient $r = 0.72$, $p = 0.001$

Interpretation: Strong positive relationship; personal selling improves marketing effectiveness.

6.1.4. Regression Analysis (H2)

Dependent Variable: Industrial Purchase Decisions

Independent Variables: Salesperson Expertise, Relationship Quality, Communication Effectiveness

Table-6: Regression Output

Variable	Coefficient (β)	t-value	p-value
Expertise	0.35	4.12	0.000
Relationship Quality	0.28	3.45	0.001
Communication	0.22	2.89	0.005
R²	0.68	F = 25.4	0.000

Interpretation: All three independent variables significantly influence purchase decisions. 68% of variance is explained by these factors.

Table-7: Overview Table of Statistical Methods and Results

Statistical Method	Objective	Sample Result	Interpretation
Percentage Analysis	To examine response distribution	80% considered personal selling effective	Indicates a favourable perception among industries
Chi-Square Test	To assess the relationship between personal selling and customer satisfaction	$\chi^2 = 18.6, p = 0.002$	Shows a statistically significant association
Correlation Analysis	To determine the strength of the relationship	$r = 0.72, p = 0.001$	Reveals a strong positive correlation
Regression Analysis	To evaluate the impact of multiple variables on purchasing decisions	$R^2 = 0.68, p < 0.01$	Demonstrates that expertise, relationship, and communication significantly influence purchase decisions

Table-8: Hypothesis Testing

Alternative Hypothesis	Method Applied	Calculated Value	p-value	Level of Significance	Ho Accepted/ Rejected
H1	Pearson's Correlation	$r = 0.72$	0.001	significant	Rejected
H2	Multiple Regression	$R^2 = 0.68,$ $F = 25.4$	0.000	significant	Rejected
H3	Regression Coefficient	$\beta = 0.55,$ $t = 5.63$	0.000	significant	Rejected

H4	Chi-Square Analysis	$\chi^2 = 18.6$	0.002	significant	Rejected
H5	Paired Sample t-test	t = 4.23	0.000	significant	Rejected

7. Findings and Suggestions

Findings

- **Personal selling boosts industrial marketing performance** – Direct interaction increases trust and sales effectiveness.
- **Technical knowledge is most influential** – Expertise helps address client needs and close deals.
- **Relationship building enhances loyalty** – Strong client relationships lead to repeat business.
- **After-sales service improves retention** – Support and maintenance increase customer satisfaction.
- **Direct selling dominates industrial channels** – Preferred for clear communication and stronger client ties

Suggestions

- **Technical Training:** Equip sales personnel with product knowledge to enhance credibility and problem-solving during client interactions.
- **CRM Enhancement:** Implement or strengthen CRM systems to track interactions, manage leads, and improve customer retention.
- **Long-Term Relationships:** Focus on trust and consistent communication to foster loyalty and repeat business.
- **After-Sales Support:** Provide timely maintenance and service to increase satisfaction and reduce attrition.
- **Digital Integration:** Combine digital tools with personal selling to expand reach and streamline customer engagement.

Novelty of the Study

- **Sector-Specific Focus:** Examine industrial water treatment and chemicals separately to capture unique sector dynamics.
- **Empirical Validation:** Use real industry data to enhance the reliability and generalizability of findings.
- **Integrated Marketing Approach:** Combine technical selling with relationship marketing to improve client engagement and marketing effectiveness.

Managerial Implications

- **Adopt Consultative Selling:** Encourage sales teams to act as advisors, understanding client needs and offering tailored solutions.
- **Invest in Technical Training:** Enhance product knowledge and problem-solving skills to improve credibility and sales effectiveness.
- **Focus on Customer Retention:** Build long-term relationships through follow-ups, personalized service, and loyalty initiatives.
- **Use Hybrid Selling:** Combine digital tools (emails, virtual demos) with face-to-face interaction to expand reach and engagement.

Conclusion

The study concludes that personal selling continues to play a pivotal role in enhancing the marketing of industrial water treatment and chemical products. Despite the ongoing digital transformation, relationship-oriented selling remains predominant, reflecting the technical complexity and customized nature of these products. Firms that strategically integrate technical expertise, relationship management, and high-quality service are more likely to achieve sustainable growth and maintain a competitive advantage in the industrial sector.

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