Paper Title:

Customer-centric manufacturing: the effect of quality management systems on consumer trust in Coimbatore

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ABSTRACT:

In the evolving landscape of manufacturing, customer trust and operational efficiency have become central concerns. This study investigates the relationship between Quality Management Systems (QMS) and consumer trust in the manufacturing sector of Coimbatore. The manufacturing landscape has witnessed significant transformations in recent years, with a growing emphasis on customer satisfaction and trust. Quality management practices, including QMS, have emerged as key drivers in achieving these objectives. The research employs a mixed-methods approach, combining quantitative and qualitative methodologies. A structured survey is conducted among managers, employees, and customers of manufacturing firms in Coimbatore to gather data on QMS implementation and its perceived impact on customer trust. Statistical tools, including regression analysis, are applied to explore the intricate links between QMS practices and consumer trust. Complementing the quantitative data, in-depth insights are obtained through semi-structured interviews with industry experts, managers, and select customers. These interviews provide a qualitative perspective on the influence of QMS on consumer trust. Furthermore, case studies of manufacturing companies offer practical illustrations of QMS application and outcomes. The findings of this research contribute to the understanding of how QMS practices influence consumer trust in the Coimbatore manufacturing context. The study sheds light on the pivotal role of QMS in fostering consumer-centric manufacturing and enhancing trust in this dynamic industry. The results have implications for both practitioners and policymakers, offering actionable insights to further strengthen the manufacturing sector's customer-centric approach.

KEYWORDS: Quality Management Systems (QMS), Consumer Trust, Manufacturing Sector, Customer-centric manufacturing, Customer Satisfaction, Trust and training

1. INTRODUCTION:

In the rapidly evolving landscape of global manufacturing, the Coimbatore region has emerged as a significant player, renowned for its diverse industrial base. At the heart of this industrial prowess is a commitment to quality—a factor that has increasingly become a cornerstone for customer satisfaction and trust. This study delves into the intricate dynamics between the implementation of Quality Management Systems (QMS) and their consequential impact on customer satisfaction within the manufacturing industry of Coimbatore.

The adoption of QMS, including widely recognized frameworks such as ISO 9001, has been pivotal in streamlining processes, minimizing errors, and ensuring consistency in production. This, in turn, is not just a compliance measure but a strategic tool that potentially elevates customer trust and loyalty. With the manufacturing sector facing intense competition and discerning customers who demand nothing short of excellence, the role of QMS becomes even more crucial.

Coimbatore's manufacturing landscape, with its rich mix of textiles, automotive components, and engineering goods, among others, provides a fertile ground for examining how quality initiatives translate into customer-centric benefits. This research aims to uncover the extent to which QMS and related training programs enhance product quality and productivity, subsequently fostering a culture of continuous improvement and customer trust.

Through a systematic exploration of Coimbatore's manufacturing industry, the study will offer insights into the efficacy of quality management practices, the perception of these practices by the customer base, and the tangible outcomes that businesses experience. The findings are expected to underline the importance of a customer-focused approach in manufacturing, emphasizing how quality management is not just an operational necessity but a strategic enabler of customer satisfaction and business success.

2. PROBLEM STATEMENT

The manufacturing sector in Coimbatore has been at the forefront of industrial growth and innovation in India. However, in an era where global competition is intensifying and customer expectations are soaring, manufacturers are increasingly pressured to enhance quality and productivity while ensuring customer satisfaction. Despite the potential benefits of implementing Quality Management Systems (QMS), there is a knowledge gap regarding the actual impact these systems have on customer trust and satisfaction in the regional context of Coimbatore's manufacturing industry.

This study aims to address the critical problem of how QMS and associated training initiatives influence the perceived quality and productivity from the customer's standpoint. While QMS are designed to improve operational processes, the extent to which these enhancements translate into increased customer satisfaction and trust remains underexplored, particularly within the unique industrial environment of Coimbatore. There is a need to empirically investigate whether the adherence to QMS within this regional manufacturing hub does indeed correlate with higher customer approval ratings and if so, to what degree.

Furthermore, the problem extends to understanding the specific elements of QMS that are most significant in affecting customer perceptions and identifying potential areas where manufacturers may need to adjust their focus to meet customer demands more effectively. The absence of such insights may lead to a misallocation of resources or a misdirection of strategic efforts, thus impeding the ability of Coimbatore’s manufacturers to leverage quality as a competitive differentiator in both domestic and international markets. This study seeks to fill these gaps, providing a comprehensive analysis of the relationship between quality management practices and customer satisfaction in the manufacturing industry of Coimbatore.

3. LITERATURE REVIEW

Here's a synthesized literature review focusing on the impact of Quality Management Systems (QMS) and training on customer satisfaction in the manufacturing industry, particularly in the Coimbatore region:

The landscape of quality management in manufacturing has evolved significantly over recent years, with a strong focus on customer satisfaction and operational efficiency. Abdallah, Phan, and Matsui (2016) explored the interplay between managerial and technological innovations and their effects on operational performance in the manufacturing sector. Their

study underscores the critical role of innovative management practices, including QMS, in enhancing customer satisfaction and operational efficiency.

Ahuja and Khamba (2007) provided a practical perspective by evaluating Total Productive Maintenance (TPM) initiatives in an Indian manufacturing enterprise. Their findings suggest that TPM, as an integral component of QMS, can significantly improve equipment reliability and maintenance efficiency, which are key contributors to customer satisfaction.

Al-Refaie, Ghnaimat, and Ko (2011) extended this discussion by examining the effects of quality management practices on customer satisfaction and innovation in Jordanian manufacturing companies. Their research highlights a direct correlation between the implementation of systematic quality practices and improvements in customer satisfaction levels, alongside fostering innovation.

Furthermore, Anholon, Rampasso, Ordonez, da Silva, Quelhas, and Leal Filho (2017) investigated the challenges encountered during the implementation of QMS in Brazilian manufacturing companies. This study provides insights into the obstacles and barriers that organizations face in aligning their quality management practices with customer expectations and industry standards.

Lastly, Arumugam, Fong, and Ooi (2018) delved into the relationship between TQM practices and quality management performance, utilizing data from ISO 9001:2000 certified firms in Malaysia. Their findings revealed a positive relationship between comprehensive TQM practices and enhanced quality management performance, further solidifying the link between effective quality management and customer satisfaction.

These studies collectively emphasize the importance of integrating quality management systems and training into manufacturing operations. They underscore that effective QMS implementation not only streamlines operational processes but also significantly contributes to enhancing customer satisfaction, which is increasingly becoming a key differentiator in the competitive manufacturing industry. This is particularly relevant for the Coimbatore region's manufacturing sector, where adopting and adapting these practices could lead to marked improvements in both customer satisfaction and operational excellence.

4. RESEARCH GAP

The existing literature extensively explores the impact of Quality Management Systems (QMS) and training on operational performance and customer satisfaction in manufacturing, but there is a notable research gap in understanding these dynamics within the specific context of Coimbatore, India. Studies lack depth in regional nuances and the unique challenges faced by the Coimbatore manufacturing sector. Additionally, there is limited research on how individual components of QMS, especially employee training, directly influence customer satisfaction. The evolving role of QMS amidst technological advancements and market changes, particularly in relation to digital transformation, is also underexplored. Moreover, the financial implications of QMS on the profitability and cost structure of manufacturing firms in Coimbatore remain inadequately addressed. Bridging these gaps could provide crucial insights for optimizing QMS and training strategies to enhance customer satisfaction and business performance in the Coimbatore region.

5. OBJECTIVES OF THE STUDY

- To assess the influence of quality management systems on consumer trust in Coimbatore's manufacturing sector.
- To explore the effect of employee training under QMS on the productivity of manufacturing firms in Coimbatore.
- To provide suggestions to improve the customer trust and satisfaction.

6. RESEARCH METHODOLOGY

A mixed-methods research approach is proposed, combining quantitative and qualitative methodologies. The quantitative aspect will involve a structured survey targeting managers and employees of manufacturing firms in Coimbatore, along with their customers. This survey will seek to gather data on the implementation of Quality Management Systems (QMS), employee training programs, and their perceived effects on customer satisfaction and trust. Statistical tools such as SPSS will be employed for data analysis, with techniques like regression analysis utilized to explore the relationships between QMS practices and consumer trust.

Complementing the quantitative data, qualitative insights will be gained through semi-structured interviews with industry experts, managers, and a select group of customers. These

interviews aim to collect in-depth views and experiences related to the impact of QMS on consumer trust. Additionally, case studies of selected manufacturing companies will be undertaken to gain a practical understanding of QMS application and outcomes.

7. DATA ANALYSIS AND INTERPRETATION

DEMOGRAPHIC PROFILE:

Content	Factors	No of Respondents	Percentage (%)
Age	Below 25 years	214	61.0
	25 – 35 years	66	18.8
	35 – 45 years	32	9.1
	45 – 55 years	39	11.1
Gender	Female	135	38.5
	Male	216	61.5
Marital status	Married	259	73.8
	Unmarried	92	26.2
Experience	0 to 5years	160	45.6
	6 to 10 years	154	43.9
	11 to 15years	6	1.7
	>15 years	31	8.8

Table 1. Showing demographic profile

Interpretation: The Table summarizes responses related to age, gender, marital status, and experience. Notably, the majority of respondents (61.0%) were below 25 years old, with 25 to 35-year-olds at 18.8%, 35 to 45-year-olds at 9.1%, and 45 to 55-year-olds at 11.1%. Gender-wise, 61.5% were male, and 38.5% were female. In terms of marital status, 73.8% were married, and 26.2% were unmarried. In the experience category, 45.6% had 0 to 5 years of experience, 43.9% had 6 to 10 years, 1.7% had 11 to 15 years, and 8.8% had more than 15 years. This data suggests a youthful and predominantly married survey group, with the majority having limited work experience in the 0 to 10-year range.

INFLUENCE OF QMS ON CONSUMER TRUST

Table 2. Showing the classification based on the opinion of respondents on the influence of QMS on consumer trust

S.no	Influence of QMS on Consumer Trust		SD %	D %	N %	A %	SA %
Trust in Quality Assurance							
1.	Quality management systems in manufacturing increase my trust in product quality.	No of respondents	20	47	106	**120**	58
		%	5.7	13.4	30.2	**34.2**	16.5
2.	I feel more secure about the safety of products from manufacturers with QMS	No of respondents	36	50	80	**130**	55
		%	10.3	14.2	22.8	**37.0**	15.7
Perceived Consistency in Quality							
3.	Products from manufacturers with QMS are more consistent in quality.	No of respondents	4	38	57	**157**	95
		%	1.1	10.8	16.2	**44.7**	27.1
4.	Manufacturers with QMS are more likely to meet product specifications	No of respondents	12	38	97	**140**	64
		%	3.4	10.8	27.6	**39.9**	18.2
Willingness to Recommend							
5.	Would recommend products from manufacturers that implement QMS	No of respondents	0	36	87	**187**	41
		%	0	10.3	24.8	**53.3**	11.7
6.	Perceive higher value in products from manufacturers with QMS	No of respondents	58	133	82	**63**	15
		%	16.5	37.9	23.4	**17.9**	4.3

Interpretation: This Table summarizes the positive impact of Quality Management Systems (QMS) on consumer trust. A majority of respondents expressed trust in QMS for product quality (64.4%) and safety (71.8%), with a significant percentage agreeing or strongly agreeing. They also perceived QMS-certified manufacturers as consistent in quality (71.8%) and likely to meet product specifications (67.5%). Most respondents showed willingness to recommend products from such manufacturers (77.6%). While many saw higher value in these products (54.4%), a minority disagreed (22.1%). In summary, QMS appears to positively influence consumer trust in various aspects, despite some dissenting views on perceived value.

RANKING FACTORS IN ORDER OF THEIR IMPORTANCE IN INFLUENCING THE TRUST IN A PRODUCT

Table 3. Showing the ranking based on the opinion of respondents on the importance in influencing the trust in a product

Ranks		1	2	3	4	5	6	7	8			RANK
Garret value(X)		80	68	60	53	47	40	32	20			
Brand Reputation	F	60	289	53	78	99	127	37	51			III
	Fx	4800	19652	3180	4134	4653	5080	1184	1020	43703	55.04	
Implementation of QMS	F	255	121	47	73	169	75	26	28			I
	Fx	20400	8228	2820	3869	7943	3000	832	560	47652	60.02	
Product Reviews	F	183	91	131	129	85	91	44	40			II
	Fx	14640	6188	7860	6837	3995	3640	1408	800	45368	57.14	
Price	F	70	75	74	248	152	45	74	56			V
	Fx	5600	5100	4440	13144	7144	1800	2368	1120	40716	51.28	
Warranty and Return Policies	F	99	51	227	145	68	77	90	37			IV
	Fx	7920	3468	13620	7685	3196	3080	2880	740	42589	53.64	
Customer Service and Support	F	47	90	74	63	98	243	148	31			VI
	Fx	3760	6120	4440	3339	4606	9720	4736	620	37341	47.03	
Recommendations from Friends/Family	F	63	42	144	45	86	58	271	85			VII
	Fx	5040	2856	8640	2385	4042	2320	8672	1700	35655	44.91	
Environmental and Ethical Practices	F	17	35	44	21	37	75	105	460			VIII
	Fx	1360	2380	2640	1113	1739	3000	3360	9200	24792	31.22	

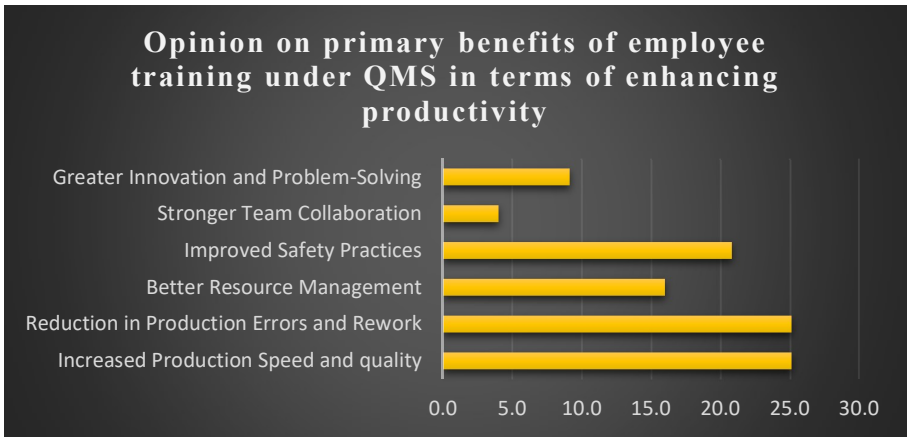
Interpretation: This table ranks factors influencing consumer preferences and decisions. "Implementation of QMS" holds the highest rank (I), signifying its utmost importance with a weighted value of 47,652. "Brand Reputation" follows at rank three (III) with a weighted value of 43,703. "Product Reviews" secures rank two (II) at 45,368. "Warranty and Return Policies" take rank four (IV) with 42,589, and "Price" is fifth (V) at 40,716. "Customer Service and Support" ranks sixth (VI) with 37,341, while "Recommendations from Friends/Family" is seventh (VII) at 35,655. "Environmental and Ethical Practices" is eighth (VIII) with 24,792. Overall, this ranking underscores "Implementation of QMS" and "Brand Reputation" as the most influential factors in consumer choices, providing a clear picture of their relative importance.

EFFECT OF EMPLOYEE TRAINING UNDER QMS ON PRODUCTIVITY

S.no	Influence of QMS on Consumer Trust		SD %	D %	N %	A %	SA %
Productivity Improvement							
1.	Employee training under QMS significantly improves productivity in manufacturing	No of respondents	16	36	74	**115**	110
		%	4.6	10.3	21.1	**32.8**	31.3
2.	Training programs under QMS result in faster production turnaround.	No of respondents	32	36	80	**60**	143
		%	9.1	10.3	22.8	**17.1**	40.7
Impact on Product Quality							
3.	Employee training under QMS enhances the quality of the final product.	No of respondents	30	46	79	**119**	77
		%	8.5	13.1	22.5	**33.9**	21.9
4.	Training under QMS leads to fewer product defects and returns	No of respondents	6	12	94	**146**	93
		%	1.7	3.4	26.8	**41.6**	26.5
Efficiency in Production							
5.	Employee training in QMS leads to better utilization of resources, including materials and labor.	No of respondents	4	38	57	**157**	95
		%	1.1	10.8	16.2	**44.7**	27.1
6.	Training under QMS streamlines workflow, reducing time wastage and enhancing productivity.	No of respondents	6	34	65	114	**132**
		%	1.7	9.7	18.5	32.5	**37.6**

Interpretation: The Table shows a positive perception of QMS training's impact on workplace productivity, quality, and efficiency. A majority of respondents agree or strongly agree that training enhances manufacturing productivity (64.1%) and speeds up production (57.8%). In terms of quality, a consensus also exists that training improves product quality (55.8%) and reduces defects and returns (68.1%). Efficiency gains are recognized as well, with many agreeing that training ensures better resource use (71.8%) and streamlines workflow (70.1%). These percentages underscore a strong belief in the benefits of QMS training across these areas.

CLASSIFICATION BASED ON THE OPINION ON THE PRIMARY BENEFITS OF EMPLOYEE TRAINING UNDER QMS IN TERMS OF ENHANCING PRODUCTIVITY



From the chart it's clear that the benefits of employee training under a Quality Management System (QMS) in terms of productivity enhancement. A significant 25.1% of respondents each rate "Increased Production Speed and Quality" and "Reduction in Production Errors and Rework" as the top benefits, indicating a strong belief in training's impact on efficient and quality output. "Improved Safety Practices" also receives a notable 20.8%, suggesting safety is a key productivity factor. "Better Resource Management" is seen as a primary benefit by 16.0%, whereas "Greater Innovation and Problem-Solving" is valued by 9.1%, reflecting a moderate impact on productivity. The least, at 4.0%, is "Stronger Team Collaboration," implying it's seen as beneficial but less critical for productivity compared to other factors.

RELATIONSHIP BETWEEN VARIOUS DEMOGRAPHIC FACTORS AND THE PRIMARY BENEFITS OF EMPLOYEE TRAINING UNDER QMS

Null Hypothesis (H0): There is no relationship between demographic factors (such as age, education level, and years of experience) and the primary benefits of employee training under QMS in terms of productivity, quality, and efficiency.

Alternative Hypothesis (H1): There is a relationship between demographic factors (such as age, education level, and years of experience) and the primary benefits of employee training under QMS in terms of productivity, quality, and efficiency.

	Chi-Square Tests			
Age		Value	df	Asymp. Sig. (2-sided)
	Pearson Chi-Square	105.703	15	**.000**
	Likelihood Ratio	127.907	15	**.000**
	Linear-by-Linear Association	5.450	1	**.020**
	N of Valid Cases	351		
Gender	Pearson Chi-Square	46.497	5	**.000**
	Likelihood Ratio	48.610	5	**.000**
	Linear-by-Linear Association	.089	1	**.765**
	N of Valid Cases	46.497	5	**.000**
Marital status	Pearson Chi-Square	40.725	5	**.000**
	Likelihood Ratio	41.778	5	**.000**
	Linear-by-Linear Association	3.355	1	**.067**
	N of Valid Cases	351		
Qualification	Pearson Chi-Square	128.366	20	**.000**
	Likelihood Ratio	129.884	20	**.000**
	Linear-by-Linear Association	2.432	1	**.119**
	N of Valid Cases	351		
Experience	Pearson Chi-Square	74.610	15	**.000**
	Likelihood Ratio	83.956	15	**.000**
	Linear-by-Linear Association	6.079	1	**.014**
	N of Valid Cases	351		

Interpretation: The chi-square test results for all demographic factors except the linear trend in gender and marital status show a statistically significant association with the perceived benefits of QMS training. The significance values being less than .05 reject the null hypothesis for all demographic factors, supporting the alternative hypothesis that there is a relationship between demographic factors and the primary benefits of employee training under QMS. However, for gender and marital status, while there is a significant association overall, there does not appear to be a significant linear trend in the relationship.

8. SUMMARY OF FINDINGS

The findings from various Tables and surveys provide a comprehensive overview of the impact of Quality Management Systems (QMS) on consumer trust, employee productivity, and the influence of demographic factors on the perception of QMS training benefits. The majority of survey participants were young, predominantly male, mostly married, and with less than 10 years of experience. These demographics suggest the viewpoints largely come from a youthful, experienced segment of the workforce.

QMS significantly boosts consumer trust, with high percentages of respondents affirming trust in the quality and safety of products from QMS-certified manufacturers. Additionally, there is a strong willingness to recommend such products, though opinions vary on the perceived value. QMS ranks as the most influential factor in consumer decision-making, outweighing brand reputation and product reviews. Workplace productivity benefits from QMS training are evident, with majorities acknowledging improved productivity, faster production turnaround, enhanced product quality, reduced defects, and better resource utilization. This highlights the widespread advantages of QMS training in production settings. Chi-square test results show a significant relationship between demographic factors and perceived benefits of QMS training, indicating that these factors affect how employees view the benefits of QMS training. However, for gender and marital status, this relationship does not follow a simple linear trend.

Overall, these findings highlight the positive impact of QMS on consumer confidence and workplace efficiency, while also shedding light on the nuanced influence of demographic factors on perceptions of QMS training benefits.

9. SUGGESTIONS

To enhance the effectiveness of Quality Management Systems (QMS) in line with workforce demographics and consumer expectations, several focused strategies are recommended. Tailoring QMS training to cater to a predominantly young and moderately experienced workforce is crucial. This could involve integrating interactive, technology-based methods for younger employees and more in-depth, theoretical content for seasoned staff. Engaging younger employees in QMS initiatives through mentorship and career development programs that emphasize quality management's role is also essential. Given the significant impact of QMS on consumer decision-making, companies should prioritize clear communication about the benefits of QMS-certified products, particularly in terms of quality and safety. This should extend to branding and marketing efforts, with a strong emphasis on QMS certifications to enhance consumer trust and brand reputation. Continued investment in QMS training, focusing on its role in boosting productivity, improving product quality, and optimizing resource utilization, is vital. Adapting training and policies to accommodate diverse life stages and responsibilities can make QMS more inclusive, addressing the varied needs of the workforce, including considerations of gender and marital status. Finally, a continuous feedback mechanism for improving QMS strategies is key. Regularly collecting and responding to employee feedback ensures that QMS training remains effective and relevant, enhancing its benefits both internally for employee satisfaction and externally for consumer

trust and brand reputation. These initiatives will help organizations maximize the benefits of QMS in a dynamic, evolving workforce and market environment.

10. CONCLUSION

The findings from Coimbatore indicate that the implementation of robust QMS practices within manufacturing businesses significantly enhances consumer confidence in the quality and safety of products. This positive impact is evident in the heightened willingness of consumers to recommend QMS-certified products, showcasing a strong belief in their consistency and reliability. The study also underscores the importance of QMS in shaping consumer perceptions and decisions. By prominently featuring QMS certifications in branding and marketing efforts, manufacturers in Coimbatore have successfully communicated the value of these systems to their customers, thereby not only bolstering trust but also differentiating their products in a competitive market.

Furthermore, the research indicates a clear correlation between QMS practices and the perceived value of products. While there is some variation in consumer opinions regarding the overall value added by QMS certification, the predominant sentiment leans towards recognizing higher quality and safety standards in QMS-certified products. The study reaffirms that a customer-centric approach in manufacturing, underpinned by effective Quality Management Systems, is a key driver of consumer trust in Coimbatore. For manufacturers looking to strengthen their market position and build lasting relationships with customers, investing in and rigorously implementing QMS is not just a quality assurance measure, but also a strategic business imperative. This approach not only fulfills consumer expectations but also lays the foundation for sustained business growth and success in an increasingly quality-conscious market.

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