

The Role of Total Quality Management in Mitigating Negative Customer Churn in a Selected Solar Energy Company in Tianjin City, China

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Abstract

This study investigates the relationship between customer churn and total quality management (TQM) practices in an energy business company, aiming to provide insights for organizational strategy. The research explores various dimensions of customer churn, including customer satisfaction, switching costs, lifestyles, tendency to change behavior, and service usage, and examines how these factors correlate with TQM practices such as empowering employees, standardizing processes, implementing performance measurement systems, and utilizing quality tools. Key findings reveal a nuanced understanding of customer churn dynamics within the energy business company. While customer satisfaction emerges as a critical factor, significant challenges exist in addressing switching costs and aligning products/services with customer lifestyles. Moreover, the study identifies gender and age differences in perceptions of TQM practices, highlighting the importance of tailored strategies for different demographic groups. Additionally, position-related variations underscore the need for targeted initiatives to ensure consistent perceptions and practices across organizational levels. Furthermore, the correlation analysis sheds light on the relationship between TQM practices and customer churn. While some practices, such as standardizing processes, show a moderate positive correlation with customer satisfaction, others, like utilizing quality tools, exhibit weaker correlations with various dimensions of customer churn. These insights provide valuable guidance for refining TQM strategies and optimizing efforts to reduce customer churn and enhance organizational performance. In conclusion, this study underscores the intricate interplay between TQM practices and customer churn, emphasizing the need for holistic approaches to organizational strategy. By addressing the identified challenges and leveraging the strengths of TQM practices, energy business companies can cultivate a culture of quality excellence, foster customer loyalty, and drive sustainable growth in today's competitive market landscape.

Keywords: Total Quality Management, Customer Churn, Solar Energy Company, China

Introduction

As the solar energy market in Tianjin City, China progresses towards a more advanced stage of development, enterprises operating in the region are proactively exploring various strategies to augment their total quality management (TQM) practices. This concerted effort is driven by the objective of sustaining a significant market presence and cultivating enduring customer loyalty. In China, it can be

traced back to the 1950s. During this period, there was a notable emphasis on the implementation of various policies aimed at promoting TQM practices. One such policy was the 'Provisional Total Quality Management Guide for Industrial Enterprises', which played a significant role in shaping its landscape in China. Additionally, China Quality Management Association was established to provide guidance and support for the effective implementation of TQM principles in the country (Tuan & Ng, 1998). The promotion of quality, measurement, and standardization in China is currently led by two key organizations: the National Technology Supervisory Bureau (NTSB) and the China Quality Management Association. These organizations play a crucial role in advancing its principles throughout the country.

Chinese firms, despite having a strong foundation in Total Quality Management (TQM) principles, frequently demonstrate a discrepancy in product quality when compared to their global counterparts. This disparity is primarily attributed to macro institutional impediments rather than technological limitations, as highlighted by Wu and Zu in their study conducted in 2012. Recent empirical evidence suggests that there is a discernible correlation between the successful integration of Total Quality Management (TQM) principles within organizational service delivery frameworks and the subsequent positive outcomes observed in terms of enhanced customer satisfaction and improved financial performance (Ming, 2023). The issue of customer churn is a topic of great interest and importance in various industries. It presents significant challenges as it has the potential to greatly impact a company's financial performance. In the contemporary competitive market environment, there is a growing need for effective churn management strategies. These strategies utilize predictive analytics to identify customers who are at risk of churning and implement targeted interventions to mitigate this risk. By doing so, businesses can foster long-term customer loyalty and ensure their sustained patronage. In the context of the ever-changing landscape of customer service, it is crucial to comprehend and address both voluntary and involuntary churn, as well as implement strategies to efficiently manage them (Dechant, 2019). Previous studies have extensively examined the factors that contribute to customer churn, such as satisfaction levels, the impact of lifestyles, and service usage. However, it is worth noting that there has been a noticeable gap in the literature regarding the emphasis placed on interpersonal influences, which also exert a substantial influence on a customer's decision to either remain loyal or discontinue their relationship with a company (Zhang et al., 2012).

In the context of a dynamic environment, this research aims to conduct a comprehensive investigation into the utilization of Total Quality Management (TQM) methodologies to effectively address the issue of negative customer churn. This study will provide insight into the relationships and multifaceted factors that impact customer decision-making processes, with the objective of shedding light on the potential of TQM practices in mitigating customer attrition. Situated within the context of an esteemed solar energy company located in Tianjin City. Additionally, this research seeks to establish a resilient plan for the organization to cultivate a mutually beneficial association with its customers.

Statement of the Problem

The general objective of this research is to assess and analyze the total quality management practices of a selected energy business company in Tianjin City, China, and understand its impact on customer churn. In addition, it will involve identifying any significant correlations between the quality management practices and customer churn levels. Specifically, it sought to answer the following questions:

- 1.** What is the profile of the respondents in terms of:
 - 1.1. Sex;

- 1.2. Age;
- 1.3. Position?
2. What is the assessment of the respondents on the total quality management practices of the selected energy business company in terms of:
 - 2.1. empowering employees;
 - 2.2. standardizing processes;
 - 2.3. implementation of performance measurement systems;
 - 2.4. utilizing quality tools?
3. What is the level of customer churn of the energy business company in terms of:
 - 3.1. customer satisfaction;
 - 3.2. switching costs;
 - 3.3. lifestyles;
 - 3.4. tendency to change behavior; and
 - 3.5. service usage?
4. Is there a significant difference in assessment of the respondents on the total quality management practices when grouped according to profile?
5. Is there a significant difference in the level of customer churn of the energy business company when respondents are grouped according to profile?
6. Is there a significant correlation between assessment of the respondents on the total quality management practices and level of customer churn of the energy business company?
7. Based on the data, what enhanced training plan can be proposed for the selected energy business company?

Research Methodology

The researcher utilized a quantitative comparative correlational research design to robustly analyze the relationship between total quality management practices and the level of negative customer churn in a solar energy company based in Tianjin City, China. This design produced numerical data and employed statistical methods, which were essential in scrutinizing the distinct yet interconnected facets of the business landscape at hand. The comparative aspect enabled the researcher to derive the differences in the assessment of the respondents from different sub-groups based on the respondents' profiles. This promoted a deeper understanding of the divergences and commonalities in perceptions across varied demographics. Meanwhile, the correlational dimension of the study sought to unveil the underlying relationships between the variables in question, paving the way for predictive analyses that could potentially spotlight areas for strategic improvement. In the ensuing phase of the study, the researcher employed a purposive sampling strategy to carefully select participants from among the employees of the selected solar energy company in Tianjin City, China. Specific criteria were set for the selection of participants, encompassing aspects such as experience in the industry, position held in the company, and willingness to participate in the study. Additionally, considering critical variables of the study, including customer satisfaction and service usage, the researcher intended to include participants who had direct interaction and experience with customers and the services provided by the company. The researcher devised a researcher-made questionnaire as the primary instrument to gather pertinent data from the respondents. The questionnaire was meticulously prepared based on the guidelines provided by Dillman, Smyth, and Christian (2014) and encompassed questions that were direct derivatives of the research objectives, ensuring comprehensive data collection.

tailored to effectively answer the research questions. After validation and reliability testing, the finalized questionnaire was deemed ready for distribution to the larger sample of respondents. It was designed to garner insights that were both deep and wide-ranging, offering a detailed understanding of the perspectives of the individuals who were integral parts of the energy business ecosystem.

By adhering to rigorous procedures for ensuring the validity and reliability of the research instrument, the researcher set a path to secure robust, credible, and dependable findings that could serve as a strong foundation for the conclusions and recommendations derived from the study. In the analysis of the data gathered from the survey, various statistical tools were utilized to interpret the results accurately and to address the research objectives adequately. Once the data was collected, it was organized and presented in tables and graphs for a clearer visualization of the findings, facilitating easier interpretation. The SPSS software was used for data processing and analysis to ensure the precision of the results and to conduct the necessary statistical tests efficiently.

Results and Discussion

1. The result presents a detailed profile of respondents, revealing a balanced gender distribution with 46.2% male and 53.4% female. The majority of respondents fall within the 25-35 age bracket, accounting for 29.1%, followed by 36-45 (24.7%), 46-55 (25.9%), and those aged 56 and above (19.9%). The distribution also reveals a balanced representation across various organizational levels, with executive-level respondents accounting for 29.1%, middle management (24.7%), supervisory (25.9%), and support staff (19.9%). This diverse representation of respondents enhances the validity and generalizability of the study's findings, allowing for informed decision-making and strategic planning. Researchers can identify potential patterns or correlations that may influence respondents' perceptions and responses to the variables, providing valuable insights into areas of strength or improvement within the company. In conclusion, the detailed profile of respondents serves as a crucial foundation for interpreting and analyzing the study's results, contributing to evidence-based decision-making and organizational effectiveness.
2. Empowering employees is crucial for fostering innovation, engagement, and continuous improvement within organizations. The highest weighted mean in Table 2 is "Employees feel valued and recognized for their contributions to the company," with a score of 3.04. This indicates that respondents perceive the company as successful in valuing and recognizing the contributions of its employees. However, there may be room for improvement in providing employees with the necessary resources and support to carry out their jobs effectively. The overall mean of the indicators is 2.846, falling within the "Practiced" range. This indicates a general agreement among respondents regarding the practiced level of empowering employees within the company. While there are areas of strength, such as recognizing employee contributions, there are also areas for improvement, such as providing adequate resources and support. By addressing these areas, the company can further enhance its efforts to empower employees, ultimately leading to improved organizational performance and employee satisfaction. In addition, the company has well-documented procedures for all key processes, a strong emphasis on adhering to set standards and procedures, regular reviews and updates of processes to maintain high standards, and standard operating procedures being communicated clearly to all employees. In summary, the company demonstrates a commitment to standardizing processes, as evidenced by the generally positive perceptions of respondents. However, there are opportunities for improvement, particularly in terms of regularly reviewing and updating processes to maintain high standards. By

addressing these areas, the company can further enhance its ability to ensure consistency, efficiency, and quality in operations, ultimately leading to improved organizational performance and customer satisfaction.

Moreover, the company has a comprehensive performance measurement system, which allows for holistic assessment of organizational performance across various metrics. However, the indicator with the highest weighted mean is "The company has a comprehensive performance measurement system in place," which indicates that respondents perceive the company as successful in implementing such a system. The lowest weighted mean is "The performance metrics are aligned with the company's strategic goals," suggesting that there may be room for improvement in ensuring alignment between performance metrics and strategic objectives. Aligning performance metrics with strategic objectives is crucial for driving organizational success and directing efforts towards overarching priorities. Also, the company employs quality tools to enhance processes, train employees to use them effectively, and utilizes them in problem-solving and decision-making processes. The company encourages innovation and continual improvement through the use of quality tools, and makes them accessible and easy to use for employees. The overall mean of the indicators in Table 5 is 2.918, indicating a consensus among respondents regarding the practiced level of utilizing quality tools within the company. While strengths include effective training provision and encouragement of innovation, areas for improvement lie in effectively measuring and communicating the impact on product/service quality. By addressing these areas, the company can further enhance its capacity to stimulate process enhancement, innovation, and overall organizational efficacy.

3. The energy business company's customer satisfaction is generally positive, with respondents expressing a strong commitment to ensuring customer satisfaction. However, there is room for improvement in actively seeking customer feedback. The company's practices in addressing customer complaints and issues are generally agreed upon, but there is room for improvement in actively seeking feedback. The company's level of customer churn is also high, with customers finding it easy to switch to competitors' products or services. The company offers incentives to retain customers, but customers are likely to incur significant costs if they switch. The company has exclusive features or services that are not easily available with competitors, and the company has built strong relationships with customers that deter them from switching. All indicators in Table 7 fall within the "High Churn" category, indicating significant challenges for customer retention. Customers perceive switching to competitors as relatively easy, with little deterrent from the company's incentives or exclusive features. The overall mean of 2.777 confirms the presence of high churn within the company.

In terms of lifestyle alignment, the company's products/services align well with the lifestyles of its target customer base. The company adapts its offerings to suit the changing lifestyles and preferences of customers, actively promotes a lifestyle that is congruent with its brand, and sees its offerings as enhancing the lifestyle of its customers. The company takes into consideration socio-cultural factors influencing customers' lifestyles in its marketing strategies. Hence, the company has a deep understanding of the lifestyle needs of its customer base, scoring 3.10. This indicates that respondents perceive the company positively in terms of understanding customer lifestyle needs. Such understanding is fundamental for tailoring products and services that resonate with customers, potentially reducing churn by enhancing satisfaction and loyalty.

The energy business company's customer churn is a significant factor in its overall success and growth. The company's products and services are not aligned well with the lifestyles of its target customer

base, which results in high churn. This indicates a need for improvement in aligning offerings with customer lifestyles to reduce the likelihood of churn. The company's customers frequently change their purchasing behaviors, making it difficult for the company to adapt to these changes. The company is agile in adapting to these changes, but there is a need for improvement in agility to stay ahead of market trends and better meet evolving customer needs.

In terms of service usage, the company has measures in place to encourage increased usage of its services by customers, which can lead to higher customer engagement and satisfaction. However, the company's user-friendliness and accessibility of its services are also important factors. Ensuring services are user-friendly and accessible can enhance customer satisfaction and loyalty, mitigating the likelihood of churn. Despite the company's efforts to incentivize increased usage, there are opportunities for improvement in ensuring services are user-friendly, accessible, and optimized based on customer feedback. Addressing these areas can enhance customer satisfaction, loyalty, and ultimately reduce churn, contributing to the company's long-term success and growth.

4. The study reveals gender differences in the assessment of total quality management (TQM) practices among respondents in an energy business company. While there is a slight difference in mean scores for empowering employees and standardizing processes, it is not statistically significant. The implementation of performance measurement systems is similar across both genders, with minimal differences. However, there is a significant difference in mean scores for the utilization of quality tools, suggesting that gender influences perceptions of how these tools are utilized. Despite this, overall perceptions of TQM practices do not vary significantly based on gender. This suggests a need for further exploration and targeted improvement efforts to ensure gender-neutral perceptions and practices in quality tool utilization within the company. The findings suggest a need for further exploration and targeted improvement efforts to ensure gender-neutral perceptions and practices in TQM practices.

The study examines the perceptions of employees and management in an energy business company. The results show that age does not significantly impact the perception of empowerment practices within the company. However, there is a significant difference in mean scores across different age groups for standardizing processes and performance measurement systems implementation.

The study also found no significant difference in mean scores across positions within the company. This suggests that individuals in different positions hold similar perceptions regarding empowerment practices within the company. However, there is a notable difference in mean scores across positions for standardizing processes.

Regarding performance measurement system implementation, there is no significant difference in mean scores across positions. This implies that individuals in different positions perceive performance measurement system implementation similarly. However, for the utilization of quality tools, there is a significant difference in mean scores across positions. This indicates that perceptions of quality tool utilization vary significantly among individuals in different positions. Overall, when considering all TQM practices collectively, there is no significant difference in mean scores across positions. This suggests that overall perceptions of TQM practices do not significantly differ based on position within the company. In summary, while position differences do not significantly impact overall perceptions of TQM practices, significant variations exist in perceptions of standardizing processes and utilizing quality tools among individuals in different positions. These findings underscore the importance of considering position-related factors in tailoring TQM strategies and initiatives within the company.

5. The study reveals that gender significantly impacts customer churn in an energy business company. It shows a significant difference in mean scores between male and female respondents regarding customer satisfaction, switching costs, lifestyles, and the tendency to change behavior. While gender differences do not significantly impact these factors, they do influence customer satisfaction, lifestyles, the tendency to change behavior, and the overall level of customer churn. Age also significantly impacts customer satisfaction, but there are no significant differences in mean scores across different age groups for switching costs, lifestyles, or the tendency to change behavior. For service usage, there is no significant difference in mean scores across different age groups. The study also presents discrepancies in customer churn levels among different positions held by respondents. There is a significant variance in mean scores across different positions, with Executives having the highest mean scores. The F-test results indicate that position significantly impacts customer satisfaction, but no significant differences exist for switching costs, lifestyles, the tendency to change behavior, or service usage.
6. The correlation analysis between total quality management (TQM) practices and customer churn in an energy business company provides valuable insights into the relationship between these variables. The study found very weak correlations between empowering employees, standardizing processes, implementation of performance measurement systems, and utilizing quality tools with various dimensions of customer churn. These findings suggest that there is no significant linear relationship between TQM practices and customer churn in terms of satisfaction, switching costs, lifestyles, tendency to change behavior, or service usage.

For standardizing processes, there is a moderate positive correlation between standardization and customer satisfaction, suggesting that as the level of standardization increases, customer satisfaction tends to improve. However, the correlations with other dimensions of customer churn—switching costs, lifestyles, and tendency to change behavior—are weak and not statistically significant. This suggests that while standardizing processes may positively impact customer satisfaction, its influence on these other aspects of customer churn is not as pronounced or significant. The implementation of performance measurement systems also showed weak correlations with various dimensions of customer churn, suggesting that there is no clear relationship between the implementation of these practices and the different facets of customer churn in the energy business company. While performance measurement systems are crucial for monitoring and evaluating organizational performance, their direct impact on customer churn may be limited. Lastly, the correlation analysis for utilizing quality tools showed a moderate positive correlation with customer satisfaction, suggesting that as the company effectively employs quality tools, there tends to be an increase in customer satisfaction. However, the correlations between utilizing quality tools and other dimensions of customer churn—switching costs, lifestyles, and tendency to change behavior—are not statistically significant.

Conclusion

This study provides a comprehensive analysis of the perspectives of energy business companies, focusing on their overall performance and customer satisfaction. The research highlights the importance of empowering employees to foster innovation, engagement, and continuous improvement. The study also emphasizes the need for regular reviews and updates on processes, alignment of performance metrics with strategic goals, and the use of quality tools.

The study also highlights areas for improvement in customer satisfaction and churn. While the company values employee contributions, there is room for improvement in providing necessary resources and support. The study also emphasizes the importance of lifestyle alignment in reducing churn. The company faces challenges in adapting to evolving customer behaviors and market trends, highlighting the need for agility and responsiveness in its strategies.

Gender differences in Total Quality Management (TQM) perceptions are not statistically significant, suggesting a relatively gender-neutral perception of TQM practices. However, age does influence perceptions of empowerment practices, and age does not significantly impact empowerment practices. Position-related factors should be considered when tailoring TQM strategies.

Gender differences significantly impact customer satisfaction, switching costs, lifestyles, and the tendency to change behavior. The study reveals disparities in customer churn levels among different positions held by respondents, with executives showing the highest mean scores.

The correlation analysis between total quality management (TQM) practices and customer churn in the energy business company shows no significant linear relationship between TQM practices and various dimensions of customer churn. Organizations should adopt a multifaceted approach to address customer churn, considering various factors beyond TQM practices to effectively enhance customer satisfaction and retention.

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