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A Critical Analysis of the Theory and Practice of Total Quality Management in the Context of Saudi Consolidated Electric Company

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ABSTRACT

Total Quality Management (TQM) is a strategy organisations use to enhance their performance and competitiveness in the global market. SCECO-East, a major electricity service provider in Saudi Arabia, is implementing TQM to improve service quality and customer satisfaction. TQM is also being used in Saudi universities and hospitals, with successful implementation requiring top management commitment, employee involvement, training, recognition, process management, strategic planning, and customer focus. The present research aimed to understand TQM implementation and its impact at SCEC comprehensively. Using a mixed-method approach, the study examined the implementation of Total Quality Management (TQM) at Saudi Consolidated Electric Company (SCEC). It involved 550 participants, including 200 employees, 300 customers, and 50 key suppliers. Data was collected through surveys, interviews, focus groups, document reviews, and observations. The study found that SCEC implemented Total Quality Management (TQM) to improve service quality, reduce defects, and enhance customer trust. Employees reported increased knowledge and skills in quality management practices. Over 80% of employees rated TQM initiatives as good or excellent. Customer satisfaction increased significantly post-implementation, and defect rates decreased by 25%. Key performance indicators like on-time delivery and customer complaints consistently improved over the study period. Total Quality Management (TQM) implementation at SCEC has significantly enhanced service quality, operational efficiency, and customer satisfaction, reducing defect rates, cost savings, and positive customer feedback.

INTRODUCTION

Total Quality Management (TQM) has emerged as a prevalent strategy for organizations to enhance their overall performance and competitiveness in the global market (Ahmad *et al.*, 2015; Zentner, 2011). TQM prioritizes customer satisfaction, continuous improvement, and the active participation of all employees in the quality management process. TQM principles are utilized in the service industry to improve service quality and elevate customer satisfaction (Magd *et al.*, 2021).

SCECO-East, or Saudi Consolidated Electric Company, was established in 1976 in the Eastern Province of Saudi Arabia (SCEC, 2020). The company was formed after years of studies revealing that the only effective way to provide dependable electric power in the Eastern Province was by consolidating existing facilities and operating under central management.

SCECO-East purchased most of Aramco's electric facilities in 1977 and merged them with 26 other franchised companies (Al-Rajhi, 2001). The company aimed to provide electric power to towns and villages without electricity, upgrade existing facilities, and coordinate with the Jubail Royal Commission. SCECO-East entered into a five-year operating agreement with Aramco in 1977, entrusting them with planning, operation, maintenance, technical and administrative support, and custodianship of corporate assets (Hamza, 2015).

In 1982, existing facilities were reinforced, and additional

generating capacity was added at the Ghazlan, Shedgum, and Qaisumah power plants (ECA). The company reorganized its corporate structure in 1984 to better manage and control operations. In 1989, Qurayyah Power Plant Phase I was energized and synchronized into the grid, and in 1992, another 1,200MW capacity (Phase II) was added, bringing the total capacity to 2,400MW. SCECO-East serves around 496,000 customers, covering an area of 285,000 square kilometers, with a generation capacity of 7,200 MW and total annual power sales of 44,300 GWH.

The Saudi Consolidated Electric Company (SCECO) is the main supplier of electricity services in Saudi Arabia, catering to many households, businesses, and industrial entities throughout the nation (ELS). Positioned as a fundamental public service, SCECO assumed a pivotal role in fostering the Kingdom's economic and societal advancement. Nevertheless, in light of rising customer demands and the imperative to streamline operational effectiveness, SCECO has acknowledged the significance of integrating Total Quality Management principles to elevate its service standards and holistic operational outcomes (Mehra & Ranganathan, 2008).

The present research delves into the application of Total Quality Management within SCECO, specifically focusing on the Eastern Province. The study is designed to analyze the current status of TQM implementation within SCECO comprehensively, pinpoint areas that

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require improvement, and propose actionable strategies to enhance service quality and bolster customer satisfaction. Several key objectives will guide the research in achieving these goals.

Firstly, it will assess the existing level of TQM implementation within SCECO in the Eastern Province. Secondly, it will identify the influence of service quality within SCECO. It will analyze the gaps between customer expectations and their perceptions of SCECO service quality. Finally, based on these findings, the research will propose practical strategies tailored to improving service quality and fostering greater customer satisfaction through the effective application of TQM principles.

The present study holds great importance as it has the potential to enhance service quality and customer satisfaction within SCECO. Through its analysis of current challenges and areas needing improvement, the study offers valuable insights that can guide SCECO management in refining their TQM strategies. Additionally, the approach proposed in this research can act as a model for other public utilities in Saudi Arabia and the broader GCC region, encouraging the widespread adoption of TQM principles and implementing best practices.

Implementing TQM in a large public utility like SCECO presents several challenges. The research must tackle issues related to organizational culture, employee resistance to change, and the complexity of managing a diverse customer base with varying expectations. Additionally, it must consider the unique characteristics of the electricity service industry, such as the necessity for reliable and uninterrupted power supply and the influence of external factors like government regulations and policies (Ajayi & Osunsanmi, 2018).

The study will be guided by the core principles of TQM to address these challenges. These include a customer focus, which places the needs and expectations of customers at the centre of the quality management process; continuous improvement, which fosters a culture of ongoing enhancement by identifying and eliminating waste and inefficiencies; employee involvement, which engages all staff members in the quality management process and empowers them to contribute to service quality improvements; data-driven decision making, which bases decisions on factual data and objective evidence rather than assumptions or intuition; and a process-oriented approach, which concentrates on managing and improving key processes that impact service quality.

Total Quality Management (TQM) is gaining popularity in Saudi Arabia, enhancing organizations' competitiveness and performance by promoting continuous improvement in product and service quality culture (Alotaibi, 2014).

The public sector in Saudi Arabia is implementing Total Quality Management (TQM) to improve operational efficiency and service quality. Still, challenges include organizational and social factors, leadership commitment, and cultural and organizational alignment (Ali AlShehail *et al.*, 2022). Saudi universities are utilizing TQM applications in Information Centers (I.C.s) to improve service quality and operational effectiveness, using the

EFQM Excellence Model for continuous improvement and stakeholder satisfaction (Altamimi, 2013).

Aburayya *et al.* analyzed data using descriptive and inferential statistical techniques. It found that effective TQM implementation in hospitals requires top management commitment, employee involvement, training, recognition, process management, strategic planning, information analysis, organization culture, continuous improvement, and customer focus. Top management commitment and customer focus were the most critical CSFs affecting hospital TQM implementation (Aburayya *et al.*, 2020).

The study found that a quality philosophy is essential for successfully implementing a quality project, requiring a long-term lifestyle change for manufacturing industries. Top management commitment is crucial, alongside a substantial inflow of resources, adequate training, workforce participation, and effective measurement techniques (Way *et al.*, 2016).

Aldaweesh *et al.* explored the effective implementation of total quality management and transformational leadership in Saudi Arabian universities to improve quality and academic rankings. It examined the interplay between TQM, leadership and quality enhancement in higher education, highlighting the critical role of TQM and leadership in raising quality standards and academic performance (Aldaweesh, 2018).

METHODOLOGY

Research Design

The present research employed a mixed method approach, integrating qualitative and quantitative methods to comprehensively analyze the implementation of Total Quality Management (TQM) at Saudi Consolidated Electric Company (SCEC). The methodology was structured around the systematic TQM implementation process as outlined by Oakland (O'Toole Jr, 2011; TQM, 1993) (1993 and Flood (1995).

Dual Stages of TQM Implementation

According to Flood (1995) (Ajayi & Osunsanmi, 2018; Galperin & Lituchy, 1999), TQM implementation involves two main stages: setting up and operationalizing steering groups and quality action teams. To capture the complexity of these stages, qualitative methods (such as interviews and focus groups) provided insights into the experiences and perceptions of these involved processes. Meanwhile, quantitative methods (such as surveys and performance data analysis) measured the impact and effectiveness of these stages in a structured manner.

Systematic Proceeding of TQM

The systematic proceeding of TQM involved several critical steps, including setting up quality councils, developing a mission statement, formalizing quality improvement plans, communicating the TQM commitment, conducting organization analysis, designing training programs, identifying improvement areas, and implementing improvement plans.

Data Collection Methods

To gather comprehensive and actionable data on Total Quality Management (TQM) practices at Saudi Consolidated Electric Company (SCEC), various TQM tools and methods can be employed. In the present research study, Surveys and questionnaires were used to gather quantitative data on employee perceptions, customer satisfaction, and supplier feedback regarding TQM practices.

Sample Size

Five hundred fifty participants were selected to ensure a comprehensive and representative analysis of TQM practices at SCEC. The sample included 200 employees from different departments and hierarchical levels, 300 customers (100 residential, 100 commercials and 100 industrial), and 50 key suppliers. Sample survey questions addressed the understanding of TQM initiatives, satisfaction with quality improvement, and communication effectiveness regarding quality standards and procedures.

Selection Criteria for Participants

The selection criteria for participants in the survey and questionnaire aimed to ensure a comprehensive and representative analysis of TQM practices at SCEC.

Employees (200 Participants)

Participants were selected to ensure balanced representation from all key departments, including management, operational, and administrative staff. Employees from various hierarchical levels, from senior management to entry-level staff, were included. Priority was given to those with direct involvement or experience with TQM initiatives to provide insights from those directly impacted by these practices.

Additionally, a representative from different geographic locations or branches of SCEC was ensured. This diverse selection captured a comprehensive view of TQM practices across the organization, reflecting different roles, responsibilities and experiences.

Customers (300 Participants)

The sample was divided equally among residential (100), commercial (100) and industrial (100) users to capture diverse customer perspectives. Customers with varying electricity usage levels were included to understand how TQM practices impact different consumption patterns. Long term and newer customers were selected to compare perceptions of quality over time. The sample included customers from other regions served by SCEC to ensure geographical diversity. It will provide a holistic view of customer satisfaction and feedback on TQM practices.

Supplier (50 Participants)

The study focused on key suppliers providing critical materials and services to SCEC, assessing their experiences and perspectives on the effectiveness of Total Quality

Management (TQM) in the supply chain. It will help to identify the areas for improvement and success in TQM practices.

Data Analysis

The data collected from surveys, interviews, focus groups, document reviews, and observations were analyzed to understand TQM implementation and its impact at SCEC comprehensively.

Qualitative Data Analysis

Interviews and Focus Groups

Transcripts from interviews and focus groups were analyzed using content analysis to identify key phrases, patterns and significant statements related to TQM experiences, challenges and perceptions among employees, customers, and suppliers.

Document Review

Documents such as quality reports, performance metrics, audit findings and training evaluations were analyzed to extract qualitative insights into TQM practices, improvements and challenges.

Observations

Qualitative data from observations were analyzed to assess adherence to TQM procedures, identify inefficiencies and evaluate the effectiveness of quality control measures.

Quantitative Data Analysis

Survey Responses

Quantitative data from surveys and questionnaires were analyzed descriptively to summarize employee perceptions, customer satisfaction levels, supplier feedback and overall effectiveness of TQM practices.

RESULTS

Qualitative Data Analysis Findings

Interviews and Focus Groups

Customers expressed satisfaction with enhanced service quality, quicker issue resolution and increased trust in SCEC's commitment to quality.

Document Review

Quality reports indicated a significant decrease in defect rates post-TQM implementation, demonstrating tangible product/ service quality improvements.

Training program evaluations revealed positive feedback on TQM-related training modules, with employees reporting increased knowledge and skills in quality management practices.

Observations

Observations showed high adherence to TQM procedures in departments with strong quality councils and effective communication channels, leading to smooth workflows and fewer errors.

Quality control measures implemented as part of TQM were observed to be effective in identifying and rectifying potential quality issues in real time.

Quantitative Data Analysis Findings

Survey Responses

Over 80% of employed rate their understanding of TQM initiatives as good or excellent, indicating high awareness and engagement with quality management practices.

Customer satisfaction significantly increased post-TQM implementation, with a notable improvement in perceived service reliability and responsiveness.

Performance Data Analysis

Defect rates have decreased by 25% since adopting TQM, leading to cost savings and enhanced customer satisfaction.

Key performance indicators related to quality metrics, such as on-time delivery and customer complaints, showed consistent improvements over the study period.

DISCUSSION

Implementing Total Quality Management (TQM) at Saudi Consolidated Electric Company (SCEC) presented a multifaceted case of organizational transformation aimed at enhancing service quality, operational efficiency, and customer satisfaction. Customers and employees provided positive feedback on the enhancements in service quality and quick resolution of issues post-TQM implementation. Customers noted increased trust in SCEC's commitment to quality, which underscores the effectiveness of TQM in fostering a customer-centric culture. Employees strongly understood and engaged with TQM practices, indicating successful internal communication and training efforts.

The qualitative review of documents such as quality reports and training evaluations revealed substantial improvements in service quality and employee competencies. The significant decrease in defect rates highlighted in quality reports demonstrates the tangible benefits of TQM in reducing errors and enhancing service reliability. Positive feedback from training evaluations suggests that TQM-related training modules effectively equipped employees with the necessary skills for quality management.

Direct observations confirmed high adherence to TQM procedures in departments with strong quality councils. This adherence led to smoother workflows and fewer errors, validating the effectiveness of TQM structures and communication channels. The real-time rectification of quality issues observed indicates that TQM measures are practical and efficient in operational settings.

Quantitative survey data revealed that over 80% of employees rated their understanding of TQM initiatives as good or excellent, reflecting successful dissemination and engagement with TQM principles. Customer satisfaction scores significantly improved, with increased

perceptions of service reliability and responsiveness post-TQM implementation. These results affirmed that TQM has positively influenced employee and customer perspectives on service quality.

Performance metrics indicated a 25% reduction in defect rates since adopting TQM, leading to cost savings and higher customer satisfaction. Improvements in key performance lead to cost savings and higher customer satisfaction. Improvements in key performance indicators such as on-time delivery and customer complaints demonstrate consistent positive trends, highlighting the sustained impact of TQM on operational performance.

Implementing TQM in a large public utility like SCEC required significant cultural shifts and faced challenges related to employee resistance to change. Overcoming these challenges necessitated strong leadership commitment and a comprehensive training program to align organizational culture with TQM principles (Pambreni *et al.*, 2019; Raghavendra *et al.*, 2019).

The unique characteristics of the electricity service industry, such as the need for reliable and uninterrupted power supply, added complexity to TQM implementation. External factors like government regulations also influenced TQM practices, requiring adaptive strategies to align with regulatory requirements while maintaining quality standards (Raghavendra *et al.*, 2019).

Based on the integrated and quantitative findings, several strategic recommendations are proposed to enhance TQM practices at SCEC. First, it is crucial to strengthen employee engagement and training by investing in TQM-related training programs to maintain high levels of employee understanding and engagement. It includes fostering a culture of continuous improvement by encouraging employee involvement in quality management initiatives and recognizing their contributions.

Second, enhancing customer feedback mechanisms is essential. Implement robust customer feedback systems to regularly capture and analyze customer perceptions and expectations, and use this feedback to drive continuous improvement efforts and tailor service to meet evolving customer needs. Third, optimizing quality control measures will help maintain high service quality standards. Ensure consistent application of quality control measures across all departments and utilize real-time data to promptly identify and address potential quality issues, minimizing disruptions and enhancing service reliability.

Fourth, adapting to industry and regulatory changes is vital. Stay informed about industry needs and regulatory changes to adapt TQM practices accordingly, and collaborate with regulatory bodies to ensure compliance while perusing quality enhancement initiatives. Finally, promoting a customer-centric approach is paramount. Emphasize customer satisfaction as a core component of TQM by aligning all processes and practises with customer needs and expectations and developing customer-centric strategies prioritising service reliability, responsiveness and overall satisfaction.

LIMITATIONS

The study on Total Quality Management (TQM) implementation in SCEC, a large public utility, has limitations due to its small sample size and focus on the Eastern Province of Saudi Arabia. The mixed methods approach may not account for long-term trends, market conditions, or external factors. The data collection was self-reported, potentially introducing biases. The study also fails to capture cultural factors influencing TQM adoption and effectiveness, government regulations, and broader economic and market conditions.

CONCLUSION

It was concluded that implementing Total Quality Management (TQM) at Saudi Consolidated Electric Company (SCEC) has significantly improved service quality, operational efficiency, and customer satisfaction. It has been attributed to positive feedback from customers and employees, reduced defect rates, cost savings, and improved customer satisfaction.

RECOMMENDATIONS

➤ Future research should explore the long-term impact of Total Quality Management (TQM) practices at SCECO, compare it with other regions, and explore emerging technologies like AI and IoT.

➤ It should also examine employee engagement, customer perception, supply chain management, external factors, cross-sectoral analysis, training and development programs, and integrating TQM with environmental sustainability.

➤ The study should also examine multi-stakeholder engagement strategies and advanced data analytics techniques.

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