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Enhancing Organizational Sustainability: The Role of Total Quality Management in Fostering Talent Management Practices[*]

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Abstract

This study aimed to investigate the relationships among employees' perceptions of Total Quality Management (TQM) and Talent Management (TM) practices within their organisations, as well as the impact on Sustainability Performance (SP). The research used survey data from businesses in Istanbul, Yalova, and Kocaeli provinces. A convenience sampling method was employed, and the study utilised data from 339 managers and employees in the manufacturing sector. The data analysis was conducted using least square structural equation analysis. The study's findings revealed that an increase in the level of TQM application is associated with higher levels of TM application and improved SP in enterprises. Furthermore, it was observed that the positive impact of the TQM level increase extends to both TM and SP through a quadratic effect, in addition to its direct influence. The study demonstrated that increasing TM application significantly enhances SP, and an elevated TQM level further amplifies this relationship. Additionally, when the companies were classified based on size, it was found that the positive effect of an increased TQM implementation level on SP is significantly more pronounced in medium-sized companies compared to small and large companies. This trend was also observed in the quadratic effect analysis.

Keywords: total quality management, talent management, sustainable performance, human resource management, structural equation modeling

[*] The compliance of this research with ethical rules was accepted with the decision of the Human Researchs Ethics Committee of Bolu Abant İzzet Baysal University, dated 07.08.2023 and protocol number 2023/314.

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Örgütsel Sürdürülebilirliği Artırma: Yetenek Yönetimi Uygulamalarını Geliştirmede Toplam Kalite Yönetiminin Rolü

Özet

Bu çalışmada çalışanların içinde bulundukları kurumdaki Toplam Kalite Yönetimi (TQM) ve Yetenek Yönetimi (TM) uygulamalarına ilişkin algıları ile Sürdürülebilirlik Performansı (SP) arasındaki ilişkilerin incelenmesi amaçlanmaktadır. Çalışma İstanbul, Yalova ve Kocaeli illerinde yer alan işletmeler dikkate alınarak anket yoluyla toplanan verilerle gerçekleştirilmiştir. Bu amaçla kolayda örnekleme yoluyla yapılan çalışmada imalat sektöründeki 339 yönetici ve çalışandan elde edilen veriler kullanılmıştır. Veriler kısmı en küçük kareli yapısal eşitlik analizi yardımıyla analiz edilmiştir. Elde edilen bulgular; TQM uygulama düzeyindeki artışın işletmelerin TM uygulama düzeyini ve SP artırdığını ortaya koymaktadır. Üstelik bu ilişkide TQM düzeyindeki artış doğrudan etkisinin yanı sıra hem TM hem de SP üzerinde çarpan etkisiyle artışa neden olmaktadır. Çalışmada TM uygulama düzeyindeki artışın SP anlamlı şekilde artırdığı ve TQM uygulama düzeyindeki artışın bu etkileşimi daha da güçlendirdiği gözlenmiştir. Bulgular ayrıca firma büyüklüğüne göre yapılan sınıflandırmada küçük ve büyük firmalara göre orta büyüklükteki firmalarda TQM uygulama düzeyindeki artışın SP üzerinde meydana getirdiği pozitif etkinin anlamlı şekilde daha büyük olduğunu ve bu durumun çarpan etkisinde de geçerli olduğunu göstermektedir.

Anahtar Kelimeler: toplam kalite yönetimi, yetenek yönetimi, sürdürülebilirlik performansı, insan kaynakları yönetimi, yapısal eşitlik modellemesi

1. INTRODUCTION

In the past fifty years, Total Quality Management (TQM) and practices such as ISO 14001, ISO 26000, and ISO 28000 have rapidly expanded their scope, becoming significant tools for sustainability. However, this expansion has increased the need for more talented and skilled employees, especially in critical positions, to ensure the sustainability and success of TQM practices. The rapid changes in talent expectations and the necessity to keep up with technological advancements compel businesses to develop policies and practices focused on managing employee talents.

Due to the growing scope of TQM practices, there is an increased demand for more competent business employees and managers. Therefore, examining the relationships between TQM, talent management, and sustainability performance in organizations is important. However, it is observed that there are few studies in the literature that investigate the potential relationships between the level of TQM implementation, talent management, and sustainability. Starting from this point, this study aims to contribute original insights to the literature, mainly focusing on Turkiye, by examining the relationships between Total Quality Management practices, talent management, and sustainability performance. This research intends to show how these factors interact to gain a competitive advantage, especially in the challenging market conditions businesses face.

Total Quality Management (TQM) is a management philosophy that gained popularity through the implementation of the Toyota Production System by Japan, which was striving to recover from the economic crises following World War I and the significant scarcity experienced after World War II. Emerging in an era marked by the challenges of those times, TQM primarily aimed to improve processes through efficient and effective use of resources, as highlighted in various studies (Prajogo and Sohal, 2006; Yunis et al., 2013; Abdul Rasit et al., 2018; Saffar and Obeidat, 2020; Abbas and Kumari, 2021; Kumari et al., 2021). TQM has become a crucial tool in business because it prevents waste and enhances organisational and employee performance. With its focus on improving resource efficiency through its practices, the TQM approach has evolved into a strategic tool for businesses to gain a competitive advantage and adapt rapidly to changing environmental conditions (AlShehail et al., 2022).

The beginning of the 20th century saw the Second Industrial Revolution and the advent of mass production, which contributed to the prosperity of societies. However, this development also rapidly increased resource consumption and negative environmental impacts. Following the Second World War, there was a global increase in production, and the process of globalisation, which began with the establishment of the first wide-area computer network in the United States in 1965, further intensified pressure on businesses from stakeholders, especially consumers. In the early 21st century, discussions about the impacts of companies on nature and society gained severe attention, particularly with the agenda of global warming and climate crises. As a result, sustainability has become a significant focus in the last two decades. The dimensions of

sustainability, encompassing economic, social, and environmental aspects, have inevitably intertwined with the principles of TQM philosophy, especially in leadership, employee participation, customer satisfaction, continuous improvement, and a systemic approach.

Consequently, the interaction between the sustainability concept and the TQM philosophy has become inevitable. This is evident in the emergence of various applications and standards under the TQM umbrella, such as ISO 9001 Quality Management System, ISO 14001 Environmental Management System, ISO 16949 Automotive Sector Quality Management System, ISO 22000 Food Safety Management System, ISO 22301 Social Security and Business Continuity Management System, ISO 26000 Social Responsibility, ISO 27001 Information Security Management System, ISO 28000 Supply Chain Security Management System, ISO 31000 Risk Management, ISO 45001 Occupational Health and Safety Management System, ISO 50001 Energy Management System, among others, adopted by numerous companies as fundamental components of their business strategies (Tasleem et. al., 2018).

As part of the societal change experienced today, addressing individual and societal welfare and ensuring sustainable economic growth require resolving challenges among individuals, society, and technology. The increase in production and consumption resulting from technological advancements aimed at improving the well-being of individuals and institutions also leads to adverse environmental, social, and economic effects such as environmental pollution, rapid depletion of natural resources, and disparities in prosperity where some societies experience excessive wealth while others suffer from excessive poverty. Skilled and competent human factors play a vital role in the interaction between the business and its environment to solve these problems (Yücel, 2022). The TQM philosophy embraces a people-centric approach, summarised by leadership, participation, and customer satisfaction. Over time, this common ground has formed a significant intersection between sustainability and the TQM approach.

In the context of continuous improvement at the core of the TQM philosophy, talent management's function in developing and enhancing the most scarce resource of businesses, human resources, has become vital. The ongoing increase in the rate of change in the business environment due to digitalisation and the rise in the mobilisation of the workforce requires businesses to be more cautious and, at the same time, compel them to improve and support their human resources to adapt to these changes and acquire the necessary new skills. Therefore, talent management has gained increasing importance in TQM and sustainability.

In line with the study’s aim, the following headings are addressed sequentially: first, the concepts of Total Quality Management and sustainability and the connection between these concepts are discussed. Then, the concept of talent management and its role in sustainability are examined. In the subsequent sections, the research's methodology and findings examining the relationships between employees' perceptions of Total Quality Management and Talent Management (TM) practices and Sustainable Performance (SP) are presented. The study concludes with discussion and conclusion sections.

2. CONCEPTUALIZATION OF TOTAL QUALITY MANAGEMENT AND SUSTAINABILITY

Although the concept of quality is ancient, its significance in business persisted until the post-World War II era. Notably, the Japanese quality movement, which gained global attention, led by Crosby (1979), defined quality as "conformance to requirements." Deming (1986) emphasised customer satisfaction in defining quality as providing a product and service that meets multidimensional customer expectations. Juran (1988) considered quality to consist of product features that meet customers' needs, thereby ensuring product satisfaction. The common theme in all these definitions is fulfilling requirements related to customer needs.

Hence, the historical focus of quality was initially on product control. The foundation of this approach lies in checking whether the produced product meets the required specifications. Over time, the quality perspective gradually shifted from product control to process control, emphasising prevention over control. This shift aimed to control the process that produces defective products rather than detecting and controlling them after production. Consequently, the perspective on quality as an additional cost is transformed into a reduction in costs and an increase in productivity (Rai, 2018).

In the subsequent period, the prevention approach evolved into the quality assurance perspective with the development of statistical quality control tools. Ultimately, the current state involves the Total Quality Management (TQM) philosophy, where quality is not the responsibility of a specific unit or department but is implemented throughout all levels of management. The development of the TQM philosophy, based on Feigenbaum's (1961) views suggesting that the effort for quality should spread across all functional areas, occurred slowly and unnoticed, particularly in the 1970s, coinciding with the global economic crisis, especially in the United States. The 1980s marked the awareness of the issue and reactive developments in the U.S. economy to cope with Japanese competition. The establishment of the U.S. Malcolm Baldrige National Quality Award in 1987 and the initiation of the European EFQM Excellence Award in 1989 marked the beginning of an era where quality was recognised worldwide. As a result, the 1990s witnessed the emergence and rapid dissemination of ISO 9000 standards as internationally accepted quality management system standards.

The TQM philosophy views the concept of "Quality" as a system and adopts the concept of a "Quality Management System (QMS)" that includes managing and monitoring an entity. Therefore, by the 2000s, the QMS concept, considered an open system, has formed a broad range of management systems focusing on quality management theories and sustainability concepts, such as environmental management systems (EMS), organisational sustainability (OS), and occupational health and safety (OHS) management systems. Under the umbrella of TQM, these systems contribute to achieving organisational goals (Kutty et al., 2021)."

In today's quality world, the concept of Total Quality Management (TQM) can be described as the art of managing an organization in light of both a philosophy and a set of guiding principles that focus on continuously improving the organisation to achieve excellence. The TQM

philosophy is about continuously improving and utilising all available resources, including human resources, in the best possible way. While there are various opinions on the number and nature of TQM principles, the ISO 9000 standard summarises these principles under the following eight headings: customer focus, leadership, stakeholder participation and communication, process approach, system approach to management, continuous improvement, mutually beneficial supplier relationships, factual approach to decision making (ISO 9000 Family, 2015). With the revision of ISO 9000:2015, the "process approach" and the "system approach to management" were merged under the "process approach" principle, reducing the number of principles from eight to seven.

According to Flynn et al. (1994), TQM is an integrated approach that focuses on implementing, continuously improving, and preventing defects in processes at all levels and functions of the organisation to achieve and sustain high-quality outputs, exceeding customer expectations. TQM can be considered a management strategy that implements customer-focused quality understanding through the participation and collaboration of all stakeholders to enhance customer satisfaction and organisational performance (AlShehail et al., 2022). Özgüner and Özgüner (2015) summarise the benefits of Total Quality Management as preventing waste, increasing efficiency, improving quality, reducing costs, shortening processing times, ensuring continuous improvement and development, and balanced happiness of social stakeholders. According to Tajouri and Lakhal (2024), TQM practices in businesses not only directly increase organisational performance but also cause an indirect increase by positively affecting different concepts such as organisational learning and innovation.

Businesses today face an increasingly challenging management paradigm due to intense competition, resource scarcity, more informed and demanding consumers, innovative technologies, climate change, and increased stakeholder pressure (Silva et al., 2021). This situation has also influenced TQM as a management philosophy, leading to the emergence of numerous quality management systems. Companies must now develop appropriate strategies, considering not only the needs of internal stakeholders but also those of external stakeholders, to survive in the long term and create value for the community in which they operate.

TQM is closely related to sustainability, as defined in the UN World Commission on Environment and Development Report (1987), which states, "meeting our needs without compromising the ability of future generations to meet their own needs." Despite many reasons that bring together both concepts, the most significant and common element is their focus on considering all stakeholders and creating value for all stakeholders. While the traditional approach to firm value focuses on financial performance and shareholder value, TQM takes an approach that focuses on stakeholder value creation, including both financial and non-financial dimensions, to achieve continuous improvement and excellence. This approach serves the desired long-term economic, environmental, and social performance dimensions regarding sustainability.

The economic dimension focuses on the company's financial performance, considering its financial health and potential benefits. The social dimension focuses on various values related to employees and society, such as health and safety, working standards, equality, well-being, development, and diversity. The ultimate goal of the social dimension is to improve and preserve human and social interaction within and outside organisations. The environmental dimension focuses on various values, such as preventing pollution, using renewable resources, minimising waste, reducing emissions, and preserving biodiversity. This dimension emphasises that companies should improve their business processes in line with sustainability. In doing so, companies should focus on producing products that do not harm the environment and can be reused after completing their life cycles (Mujtaba and Mubarik, 2022).

Zink (2007) suggested combining both concepts under corporate sustainability. Silva et al. (2021) argued that TQM is an essential tool in strategically integrating Sustainable Development principles. According to Davenport et al. (2018), sustainability means that companies should consider the impact of their activities on society and the environment by using natural resources in the best possible way. In the study conducted by Lepistö et al. (2023) with 271 CEOs in Finland, it was determined that TQM positively affected environmental and social sustainability.

Companies affect the natural environment and society with product design, production processes, purchasing decisions, and business models. Therefore, they must actively contribute and participate in environmental, social, and economic sustainability. Businesses should manage all these conflicting aspects of sustainability, focusing on environmental or social performance and integrating them to manage business sustainability. TQM is concerned with eliminating negative impacts on corporate structure and the environment, working as a primary catalyst for developing corporate social responsibility in an organisation. Therefore, while TQM is seen as an approach to conducting business in an environmentally and socially friendly manner, it is also accepted as an approach to increasing the wealth of business stakeholders, which is the primary goal of economic activity. Consequently, TQM demonstrates that it is possible to balance moral principles and rational economic rules, strive for profit, and respect the interests of broader stakeholder groups. Therefore, TQM plays a crucial role in facilitating the inclusion of broad social and environmental dimensions into corporate strategy and supporting the realisation of the sustainability approach in an organisation (Jasiulewicz-Kaczmarek, 2015)."

Sustainability is the foundation of a long-term business orientation that aims to meet the needs of stakeholders both now and in the future. A sustainable company adopts the rule of living from its capital and income derived from financial, natural, human, and social capital. Accordingly, a sustainable company overcomes the conflict of objectives between economic, environmental, and social issues by integrating long-term economic success with environmental protection and socially responsible actions. Therefore, a company's overall performance is

determined by financial results and environmental and social performance (Steimle and Zink, 2006).

A study conducted by Tasleem et al. (2018) with 92 organisations in Pakistan concluded that TQM and ISO 14001 significantly influence Sustainability Performance (SP), including economic, social, and environmental sustainability, as essential strategies. The study found that implementing the ISO 14001 standard does not significantly affect economic and social sustainability but has a significant impact on environmental sustainability and overall SP. Additionally, TQM was found to perform better in each dimension of sustainability.

Nguyen et al. (2018) conducted a study examining the relationship between quality management practices and sustainability performance with data collected from 144 businesses in Vietnam. The findings suggest that quality management practices have mixed effects on economic and environmental performance while positively impacting social performance.

Alsawafia et al. (2019) examined the relationship between the quality of management and employee relationships within the company and SP in service and manufacturing businesses in the UK. The study, consisting of 430 observations, shows that an increase in the level of relationship with quality at both management and employee levels increases SP. The findings also indicate that employee involvement has a positive moderating effect. According to the authors, increasing employee and management relationships makes companies more accountable, fair, and sustainable.

Alintah-Abel et al. (2019) argue in their study conducted in the Nigerian construction sector that implementing TQM principles can achieve sustainable development. The study suggests that implementing TQM will enhance efficiency by improving customer satisfaction, organizational culture, and values, leading to increased profitability and ultimately supporting sustainability. Magd and Karyamsetty (2020) state that TQM practices are effective in manufacturing and service businesses, influencing corporate performance, excellence, and sustainability.

AlShehail et al. (2022), in their study with 430 participants in the UAE's service sector, mention that an increase in TQM practices enhances SP. Wassan et al. (2022) and Zhao et al. (2023), in their studies with manufacturing businesses in Pakistan, report that an increase in TQM practices leads to increased SP according to findings obtained from managers at different management levels. Wassan et al. (2022) also reported a positive interaction between TQM practices and organisational performance.

Saha et al. (2022) conducted a study with 240 participants working in Bangladesh’s ready-made garment (RMG) industries, examining the effects of TQM and Industry 4.0 technologies on SP. The study shows that TQM and Industry 4.0 significantly impact SP in the Bangladeshi ready-made garment sector. Additionally, it is observed that TQM mediates the relationship between

Industry 4.0 and SP. The findings indicate that TQM assists in explaining the relationship between Industry 4.0 and SP (Tajouri and Lakhal, 2024).

Therefore, within the scope of the study, the first hypothesis is formulated as

H_1: As the level of TQM implementation increases, SP increases.

3. TALENT MANAGEMENT

The dynamic nature of the contemporary business environment compels organisations to adapt to rapid changes, even anticipating them with a proactive approach to develop and implement policies and strategies accordingly. In this context, the most crucial element for organisations to adapt to environmental changes and implement policies and strategies tailored to these changes is qualified human resources. However, the changes occurring in the environment rapidly alter the competencies and capabilities required by the workforce. The global developments experienced in the last quarter-century, particularly radical changes in working conditions after COVID-19, increased mobility, and the growing need for digital skills, have heightened the demand for a more skilled workforce. Therefore, Talent Management (TM) has become a fundamental strategic area for the success and survival of businesses, emerging as a significant subject in business management. According to Tatli et al. (2013), considering the existing human resource capacity in organisations, talent shortages make TM a crucial strategic area for the success and survival of businesses.

TM is the proficiency of a firm in hiring (sourcing, attracting, selecting), engaging, developing, retaining, and benefiting from individuals to achieve goals and implement business strategies. TM is a dynamic capability determined by the working culture, working conditions, and talent development (Benitez-Amado et al., 2015). In highly competitive and changing environmental contexts, employees are expected to assume more prominent roles, essential for organisational gains. Therefore, identifying critical positions and selecting talents to fill these positions can lead to increased commitment among employees and improved firm performance. Implementing a TM system in an organisation aims to enhance the core skills and competencies of individuals in critical positions, recognise and reward value contributors, and create a competitive advantage. Therefore, the TM process includes sub-processes focusing on identifying essential positions (ICP), competency training (CT), development (D), and reward management (RM) (Jayaraman et al., 2018).

In this regard, there is a close relationship between TM and TQM, especially regarding customer focus, leadership, continuous improvement, and stakeholder engagement. Adapting human resources to environmental changes for customer satisfaction and resource usage efficiency is crucial to continuous improvement. Additionally, TM practices become a significant improvement tool for a business that has adopted the TQM philosophy, particularly in leadership and process management. This situation can increase the need for and awareness of TM practices in businesses implementing TQM.

Bou and Beltran (2005) emphasised the critical role of the human factor in the relationship between TQM and performance. Their study, conducted with data collected through a survey from quality managers or general managers of 222 service companies in Spain, including sales dealers, hotels, and transportation companies, shows that the effect of Total Quality Management on company performance increases when TQM-oriented HRM strategies are implemented. Other studies have also supported the idea that employee selection, recruitment, training, or rewarding with characteristics consistent with the TQM philosophy are crucial in the TQM-performance relationship. For instance, high leadership competencies have been linked to product quality, continuous improvement, customer focus, employee participation, and supplier quality management (Ahmad and Schroeder, 2002; Allen and Kilmann, 2001).

The relationship between TQM and performance increases the need for more qualified employees in firms, thus increasing the need to develop employee skills within a program. This need prompts firms with rising levels of TQM implementation to focus on Talent Management (TM) practices. As a natural consequence, an increase in the level of TM implementation is expected in such firms.

Therefore, within the scope of the study, the second hypothesis is formulated as

H_2: The TM implementation level increases as the TQM implementation level increases.

4. TALENT MANAGEMENT AND SUSTAINABILITY

Talent Management (TM) is perceived as a strategic tool that creates a competitive advantage for the organisation. The theoretical background of this perception is widely based on the Resource-Based View (RBV) approach. According to RBV, human beings are a talent resource that forms the foundation of a company's competitive power. Being valuable, rare, and difficult to imitate, human resources significantly impact organisational performance and business success. Therefore, they are considered a strategic tool (Barney, 1991). Suppose talents are valuable (unique skills of an individual), rare (especially at a high level of expertise), and cannot be imitated or perfectly replicated. In that case, they can provide a resource-based sustainability.

Schiemann (2014) describes TM as a "complete cycle" focusing on managing employees with specific and unique competencies and skills, significantly contributing to a company's performance. Thus, the TM process combines multiple strategies that allow firms to develop an effective TM system. These strategies primarily involve acquiring, developing, and retaining a company's best employees (Mujtaba et al., 2022).

TM supports operational sustainability through working conditions. A fair wage and reward system and the implementation of work-life balance programs can motivate company members to exert additional effort to embrace innovative behaviours and achieve sustainability goals outlined in the operational strategy. Skill development programs based on education contribute to the sustainable success of employees. Sustainability-related goals are prioritised in

performance evaluations and career planning, encouraging employees' environmental behaviours (Benitez-Amado et al., 2015).

In this context, while Human Resource Management (HRM) practices focus on all employees in a company, TM practices are specifically designed to attract, select, develop, and retain the best employees for strategic roles. TM identifies critical positions and creates a talent pool of potential employees, ensuring the right talent is readily available to fill essential positions when needed. Subsequently, employee competencies are developed to fulfil designated roles, fostering complete dedication to organisations (Mujtaba et al., 2022).

Ambrosius (2018) conducted a case study in the hospitality industry in Scotland, suggesting that talent development within the scope of TM supports environmental sustainability. Sparrow and Makram (2015) emphasise that talents can contribute to the organisation's ability to achieve sustainable performance. According to Kafetzopoulos and Gotzamani (2022), organisations, through Talent Management (TM), develop valuable, rare, inimitable, and non-substitutable resources that are socially complex and causally uncertain. This maximises their internal resources, providing a competitive advantage that competitors cannot easily imitate or obtain quickly. Pantouvakis and Vlachos (2020) reported, based on findings from 308 transport companies in Greece, that TM has a more significant impact on sustainability performance than leadership.

Mujtaba and Mubarik (2022) presented data from a study conducted in the manufacturing sector in Pakistan involving 196 companies selected through cluster sampling. The results indicate a significant direct impact of TM on Sustainability Performance (SP). The findings also reveal that all three dimensions of TM (acquisition, development, and retention) substantially affect SP. The results suggest that TM strategies are an indispensable source of sustainability when attracting, developing, and retaining talented employees during talent shortages. The findings emphasise that a company should consider TM as the top strategy to enhance performance.

Kafetzopoulos and Gotzamani (2022) used hierarchical regression in an empirical study with 480 company participants in Greece to show that talent development positively impacts sustainability. Entrepreneurial leadership was identified as the most effective style for economic sustainability, while transformational and interactive leadership were considered the most effective for social and environmental sustainability. According to Lepistö et al. (2023), it was determined that TQM had a positive effect on environmental and social sustainability, while HRM practices along with TQM also had a positive impact on environmental sustainability.

Elzek et al. (2023) conducted a study with 327 subjects consisting of travel agency employees in the tourism sector in Egypt, providing empirical evidence of the impact of TM practices on SP. TM's influence on SP is mediated by Green Intellectual Capital (GIC). The results highlight the significant effects of TM practices on GIC and, consequently, their substantial impact on

SP. These findings underscore the importance of a comprehensive approach to employee development, leading to intellectual capital and enhanced corporate sustainability.

Therefore, within the scope of the study, the third hypothesis is formulated as

H_3: As the TM implementation level increases, the SP level increases.

5. RESEARCH METHOD

This study focuses on the impacts of Total Quality Management (TQM) and Talent Management (TM) practices on sustainability performance (SP). It examines how the level of TQM implementation affects TM and SP in businesses and addresses how TM affects SP. Additionally, the study analyses the quadratic effects of TQM practices on SP and TM.

5.1. Method, Population, and Sample

Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed to test the research hypotheses. The method developed by Wold (1982) is a statistical approach used for modelling multivariate complex relationships between observed and latent variables. It is preferred in models with small sample sizes and many variables as it provides reliable results (Fornell and Bookstein, 1982; Lohmöller, 1982).

The analyses were conducted based on data collected through surveys from businesses with at least 20 or more employees in Istanbul, Yalova, and Kocaeli provinces. These provinces were considered within the scope of the main population, and the study used data obtained through surveys from 339 managers and employees in the manufacturing sector.

While there are various methods to consider the sample size in the literature, Child (2006) emphasises that, especially in factor analysis, the sample size should be at least five times the number of variables. Kline (2005) suggests that this coefficient can go up to 10 times, but it should be at least twice the number of variables. Siddiqui (2013) states that there should be at least 100 observations in an analysis with ten or more variables, and the ideal sample size should be between 200 and 400. Considering these criteria, the aim was to reach 400 participants in the study. Still, after the data collection process, 339 usable surveys were obtained, which is considered sufficient as the sample size is more than 200 and well above five times the number of variables.

The data obtained from the study sample were analysed using Partial Least Squares Structural Equation Analysis in the SmartPLS environment.

5.2. Research Limitations

Due to budget, time, and physical accessibility constraints, the study was limited to the manufacturing industry. Therefore, the obtained sample does not represent all sectors from an industrial perspective. Additionally, considering the sample size ratio to the number of variables

is 5:1, the Partial Least Squares Structural Equation Analysis method was deemed more appropriate for the study. Given that a sufficient sample size was reached for testing the research model using the chosen method, the study results are valid and reliable in representing the population.

5.3. Variables, Data, and Research Model

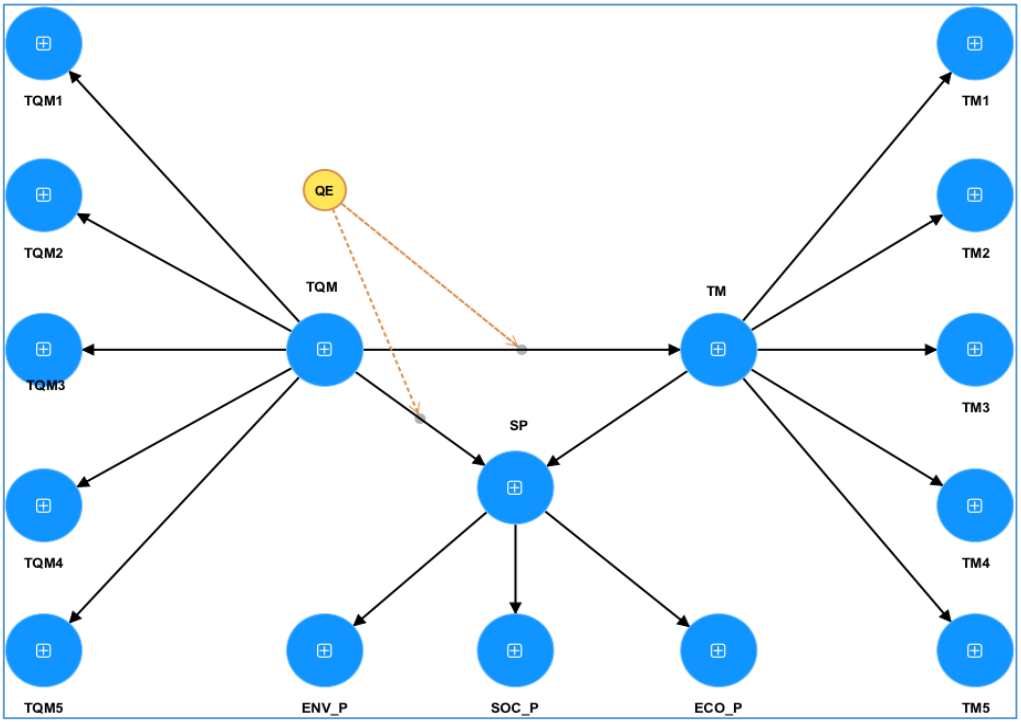
The scale used by AlShehail et al. (2022) was employed to measure TQM and SP in the study. The TQM practices scale consists of 25 statements in 5 sub-dimensions: Leadership, People, Processes, Strategy and Policy, Partnership and Resources. The SP scale encompasses 15 statements in three sub-dimensions: Environmental, Social, and Economic.

The scale used by Mujtaba et al. (2022) was utilised to measure TM. This scale comprises 26 statements organised into 5 sub-dimensions: identification of critical positions, talent acquisition, talent development, talent engagement, and talent retention. The scale measures participants' perceptions of talent management in their respective organisations.

All variables were measured on a Likert scale as follows: 1="Strongly Disagree"; 2="Disagree"; 3="Somewhat Disagree"; 4="Somewhat Agree"; 5="Agree"; 6="Strongly Agree".

The relationships between the variables measured using the scales explained above and the research hypotheses were examined within the scope of the research model presented in Figure 1.

Figure 1: Research model and hypotheses



4. FINDINGS

6.1. Demographic Findings

Among the 339 participants in the survey, 29.7% were female, and 70.3% were male. 96.5% of the participants had work experience ranging from 1 to 30 years. Regarding educational background, 43.1% had associate degrees or lower, 51.1% had bachelor's degrees, and 5.8% had postgraduate education. The ages of the participants varied between 20 and 75 years, with 25% in the age group of 27 and below, 50% in the age group of 37 and below, and 75% in the age group of 45 and below.

6.2. Factor and Reliability Analyses

Factor and reliability analyses were conducted to examine the validity and reliability of the scales and variables. In the factor analysis, a first-order confirmatory factor analysis was applied to shed light on the validity and reliability of the variables and scales. In the studies conducted, the 26th statement in the talent management scale was excluded from the analysis due to a statistically insignificant and low factor loading. As a result, based on the factor loadings and validity results presented in Table 1, it can be observed that the factor loadings and validities are above acceptable limits (Fornell and Larcker, 1981).

Table 1: Factor loadings and reliability analysis results

	TQM1	TQM2	TQM3	TQM4	TQM5	TM1	TM2	TM3	TM4	TM5	ENV_P	SOC_P	ECO_P	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
B1S1	0.754													0.783	0.787	0.852	0.536
B1S2	0.773																
B1S3	0.769																
B1S4	0.658																
B1S5	0.700																
B2S1		0.765												0.792	0.802	0.858	0.548
B2S2		0.804															
B2S3		0.762															
B2S4		0.627															
B2S5		0.732															
B3S1			0.690											0.747	0.748	0.832	0.499
B3S2			0.786														
B3S3			0.680														
B3S4			0.708														
B3S5			0.660														
B4S1				0.741										0.714	0.734	0.814	0.472
B4S2				0.740													
B4S3				0.690													
B4S4				0.737													
B4S5				0.493													
B5S1					0.670									0.729	0.730	0.822	0.480
B5S2					0.683												
B5S3					0.737												
B5S4					0.708												
B5S5					0.664												
B6S1						0.762								0.825	0.828	0.878	0.590
B6S2						0.797											
B6S3						0.739											
B6S4						0.727											
B6S5						0.811											

B7S1							0.671							0.766	0.775	0.842	0.517
B7S2							0.733										
B7S3							0.778										
B7S4							0.754										
B7S5							0.652										
B8S1								0.651						0.727	0.737	0.821	0.481
B8S2								0.736									
B8S3								0.730									
B8S4								0.585									
B8S5								0.750									
B9S1									0.651					0.719	0.742	0.815	0.474
B9S2									0.723								
B9S3									0.518								
B9S4									0.774								
B9S5									0.745								
B10S1										0.695				0.807	0.811	0.866	0.566
B10S2										0.790							
B10S3										0.776							
B10S4										0.691							
B10S5										0.801							
B11S1											0.693			0.795	0.797	0.859	0.551
B11S2											0.784						
B11S3											0.707						
B11S4											0.755						
B11S5											0.767						
B12S1												0.739		0.757	0.759	0.838	0.510
B12S2												0.773					
B12S3												0.750					
B12S4												0.631					
B12S5												0.668					
B13S1													0.766	0.752	0.754	0.835	0.504
B13S2													0.753				
B13S3													0.703				
B13S4													0.659				
B13S5													0.663				

TQM: Total Quality Management **TQM1:** Leadership **TQM2:** People **TQM3:** Process **TQM4:** Strategy and Policy **TQM5:** Partnership and Resources

TM: Talent Management **TM1:** Identification of Critical Positions **TM2:** Talent Acquisition **TM3:** Talent Development **TM4:** Talent Engagement **TM5:** Talent Retention

SP: Sustainability Performance **ENV_P:** Environmental Sustainability Performance **SOC_P:** Social Sustainability Performance **ECO_P:** Economic Sustainability Performance

All values in the table are significant at the 1% level.

Table 1 shows that the standardized loading coefficients for the variables are at least 50% or above. Additionally, all variables have reliability values above 70%, and the explained average variance value is close to or above the expected value of 50%. These findings indicate that Cronbach's Alpha values are above 0.70, demonstrating acceptable and high internal consistency reliability of the variables in the measurement tool. Similarly, the values of rho_A and rho_C being above 0.70 also suggest that structural reliability of the variables is achieved (Fornell and Larcker, 1981). In the assessment of the validity of the variables in the measurement tool, the Average Variance Extracted (AVE) value and the Fornell and Larcker criterion were utilized. Chiang and Hsieh (2012) state that the AVE value should be 0.50 or higher. Hair et al. (2010) suggest that these values would still be valid, slightly below this threshold, depending on the number of questions and the sample size. Considering the sample size for the variables, AVE values close to or above 50% indicate that discriminant validity is achieved.

Furthermore, when examining the Fornell and Larcker criterion values presented in Table 2, it is observed that the correlation between the variables and other variables is less than the square root of the relevant variable's AVE value. Thus, discriminant validity is established.

Table 2: Fornell and larcker criterion values

	TM1	TM2	TM3	TM4	TM5	TQM1	TQM2	TQM3	TQM4	TQM5	ENV_P	SOC_P	ECO_P
TM1	0.768												
TM2	0.687	0.719											
TM3	0.672	0.561	0.693										
TM4	0.590	0.596	0.612	0.688									
TM5	0.566	0.656	0.598	0.725	0.752								
TQM1	0.654	0.523	0.598	0.589	0.516	0.732							
TQM2	0.680	0.640	0.623	0.601	0.576	0.596	0.740						
TQM3	0.684	0.646	0.595	0.590	0.563	0.701	0.678	0.706					
TQM4	0.689	0.628	0.591	0.529	0.542	0.595	0.603	0.599	0.687				
TQM5	0.794	0.712	0.627	0.577	0.621	0.606	0.659	0.677	0.709	0.693			
ENV_P	0.625	0.588	0.548	0.608	0.641	0.551	0.581	0.543	0.571	0.619	0.742		
SOC_P	0.642	0.632	0.599	0.651	0.684	0.587	0.604	0.582	0.592	0.664	0.682	0.714	
ECO_P	0.678	0.661	0.622	0.721	0.675	0.592	0.662	0.594	0.633	0.678	0.670	0.744	0.710

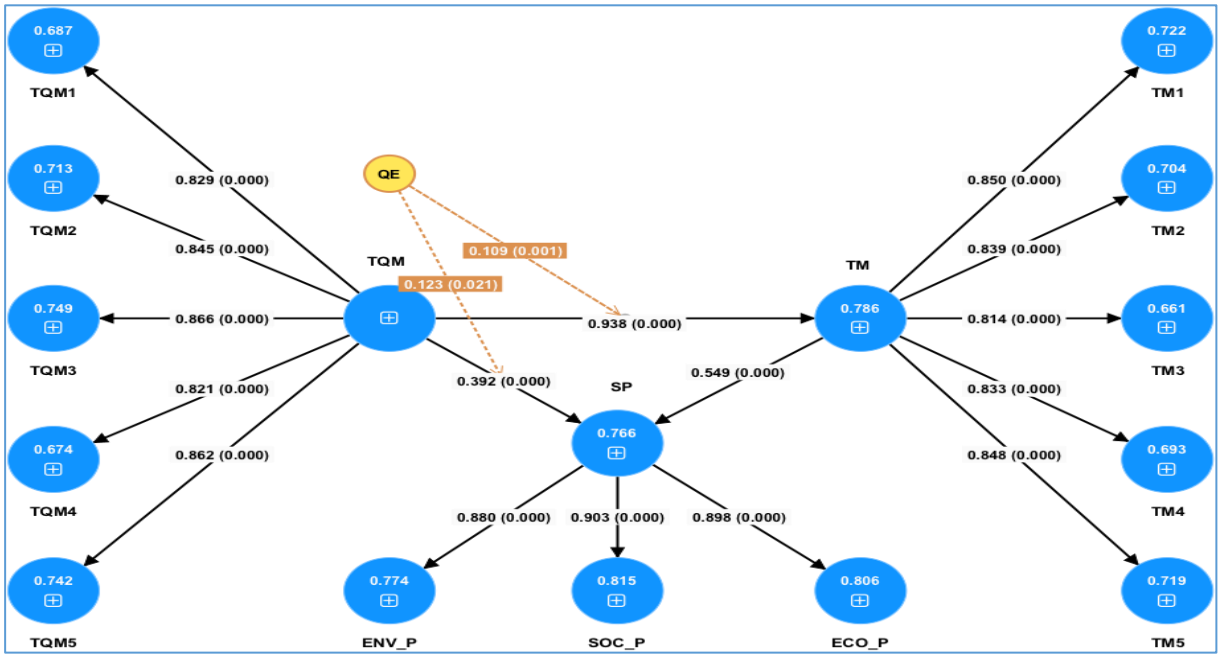
The values in Table 2 indicate that the correlation between variables and other variables is less than the square root of the AVE value for the respective variable. This demonstrates that discriminant validity is achieved.

6.3. Analysis of Interrelationships between Variables

In the scope of the research, the partial least squares structural equation modelling method was used to examine the relationships between variables. The results of the analysis, which are statistically significant at least at the 1% level, are observed in Figure 2. When the results are examined, it is seen that employees' perceptions of TQM have a significant positive impact on TM and SP. Similarly, increasing TM has a significant and positive effect on SP.

These analysis results indicate that employees' perceptions of quality management have a positive impact on talent management and sustainability performance. Likewise, the increase in talent management has a positive effect on sustainability performance.

Figure 2: Results of the path analysis between variables



The statistical test results indicate that an increase in TQM has a significant (<0.01) and positive effect on TM (0.938) and SP (0.392). This implies that the hypotheses H_1 and H_2 of the research are accepted. Considering the explained variances of the variables, there is a significant corrected R2 value of 78.6% in the relationship between TQM and TM, indicating that TQM practices are a strong predictor of TM. Similarly, a significant (<0.01) and positive relationship is observed between TM and SP, with a standardized effect level of 0.549. This finding implies the acceptance of hypothesis H_3. The presence of a significant corrected R2 value of 76.6% between TQM, TM, and SP draws attention, indicating that TQM practices are significant predictors for both TM and SP. Therefore, in addition to its direct effects, TQM has an indirect positive significant effect on SP (0.515) through its positive impact on TM.

These results support the research hypotheses put forward within the study's scope. Table 3 shows the research hypotheses and the hypothesis results according to the findings.

Table 3: Research hypotheses and test results

Hypotheses	P Value	Result
H_1: As the level of TQM implementation increases, SP increases.	0.000	Accept
H_2: As the level of TQM implementation increases, the level of TM implementation increases.	0.000	Accept
H_3: As the level of TM implementation increases, the level of SP increases.	0.000	Accept

The findings also reveal that TQM practices not only have direct effects on TM and SP but also have quadratic effects. This means that as the level of TQM implementation increases, there is a significant increase proportional to the square of this increase in both TM and SP. In this regard, TQM has a significant direct quadratic effect of 0.109 on TM and 0.123 on SP, both at a standardized effect level of (<0.01). Furthermore, the direct quadratic effect of TQM on TM also results in a significant indirect quadratic effect of 0.06 on SP at a standardized effect level of (<0.01).

The high interaction and the existence of both direct and indirect effects among the variables not only underscore the importance of TQM and TM as significant predictors for SP but also indicate a much more complex and profound relational structure among the variables. The total standardized interaction values between variables can be seen in Table 4.

Table 4: Total standardized interaction level between variables

Path	Total effects	Path	Total effects
SP -> ECO_P	0.898	TQM -> TM3	0.764
SP -> ENV_P	0.880	TQM -> TM4	0.782
SP -> SOC_P	0.903	TQM -> TM5	0.796
TM -> ECO_P	0.493	TQM -> TQM1	0.829
TM -> ENV_P	0.483	TQM -> TQM2	0.845
TM -> SOC_P	0.496	TQM -> TQM3	0.866
TM -> SP	0.549	TQM -> TQM4	0.821
TM -> TM1	0.850	TQM -> TQM5	0.862
TM -> TM2	0.839	QE (TQM) -> ECO_P	0.164
TM -> TM3	0.814	QE (TQM) -> ENV_P	0.161

TM -> TM4	0.833	QE (TQM) -> SOC_P	0.165
TM -> TM5	0.848	QE (TQM) -> SP	0.183
TQM -> ECO_P	0.815	QE (TQM) -> TM	0.109
TQM -> ENV_P	0.799	QE (TQM) -> TM1	0.092
TQM -> SOC_P	0.820	QE (TQM) -> TM2	0.091
TQM -> SP	0.908	QE (TQM) -> TM3	0.088
TQM -> TM	0.938	QE (TQM) -> TM4	0.091
TQM -> TM1	0.798	QE (TQM) -> TM5	0.092
TQM -> TM2	0.788		

When the analysis of SP is conducted considering its sub-dimensions in the research model, similar results are obtained. In this regard, it has been observed that TQM and TM positively and significantly affect sustainability in the economic, environmental, and social sustainability sub-dimensions, both directly and with quadratic effects.

Multiple group analyses conducted on the research model indicate that there is no significant difference in the relationships between variables based on gender and educational level. However, when the classification is made based on the firm's size, some differences are observed among small firms with fewer than 50 employees, medium-sized firms with 50-250 employees, and large firms with more than 250 employees. Accordingly, the positive effect of an increase in TQM implementation on SP is statistically significant (0.05) more in medium-sized firms than in small and large firms. This situation is also valid for the quadratic effect of TQM on SP in medium-sized firms, where the increase is statistically significant (0.01) compared to large firms. Regarding the effects of TM, no differences are observed between the groups.

Table 5: Differences in effect levels based on firm size

	Difference (FSIZE-M - FSIZE-L)	Difference (FSIZE-M - FSIZE-S)	2-tailed p value (FSIZE-M vs FSIZE-L)	2-tailed p value (FSIZE-M vs FSIZE-S)
TM -> SP	-0.382	-0.442	0.151	0.082
TQM -> SP	0.573	0.539	0.042	0.040
TQM -> TM	0.102	0.117	0.070	0.090
QE (TQM) -> SP	0.336	0.128	0.006	0.351
QE (TQM) -> TM	0.090	0.048	0.261	0.654

7. DISCUSSION and CONCLUSION

7.1. Discussion

The results obtained in the study reveal that an increase in TQM practices enhances the level of TM implementation and SP in businesses. Moreover, in this relationship, the increase in TQM level not only has a direct effect but also leads to an increase in both TM and SP through a quadratic effect. This outcome suggests that TQM practices, considered in five sub-dimensions as leadership, people, process, strategy and policy, partnership, and resources, guide businesses from a short-term perspective towards a long-term strategic perspective, supporting an approach that serves the vision of economic, social, and environmental sustainability. The

increase in TQM implementation requires an approach encompassing all stakeholders' participation in processes to improve all processes, as it is associated with a process-oriented perspective and prioritizes customer satisfaction. As TQM implementation increases, stakeholder participation increases, allowing businesses to better understand and respond to stakeholder expectations and needs, thus developing solutions that address them more effectively. Companies paying more attention to stakeholder demands and expectations and responding to these demands and needs more quickly enhance the sustainability performance of businesses.

The finding of a positive and significant relationship between TQM and SP across economic, environmental, and social sustainability sub-dimensions aligns with the results obtained by Tasleem et al. (2018) in Pakistan, Nguyen et al. (2018) in Vietnam, Alsawafia et al. (2019) in the UK, Alintah-Abel et al. (2019) in Nigeria, AlShehail et al. (2022) in the UAE, and Saha et al. (2022) in Bangladesh, Lepistö et al. (2023) in Finland, Tajouri and Lakhal (2024) in Tunisia, supporting the results they obtained for the Turkish sample.

All the processes described above fall under the management of businesses' human resources, which play a crucial role in achieving the desired outcomes. This interaction, fueled by increasing expectations from human resources, requires more competent employees and managers who can understand and manage multifaceted stakeholder expectations. Therefore, in companies where the level of Total Quality Management (TQM) implementation increases, there is a higher need for Talent Management (TM), especially to train and ensure the readiness of employees in key positions and awareness focused on process improvement.

TQM practices require understanding processes and continuous improvement approaches through input-process-output analyses. This necessitates identifying human resources as a critical element and defining roles, responsibilities and needs analyses for all tasks. This supports an increase in the TQM level by defining critical positions, acquiring talent, developing talent, talent participation, and talent retention, all of which constitute an increase in the TM implementation level.

The study found that an increase in TM implementation significantly increases SP, and an increase in TQM level further strengthens this interaction. An increase in TM implementation positively influences SP, as it helps meet the critical human resource needs for positions supporting businesses in meeting stakeholder expectations. The findings support the results of Bratton (2018) in Scotland, Pantouvakis and Vlachos (2020) in Greece, Mujtaba and Mubarik (2022) in Pakistan, Kafetzopoulos and Gotzamani (2022) in Greece, and Elzek et al. (2023) in Egypt for the Turkish sample.

The results also indicate that, in the classification made according to firm size, the positive effect of an increase in TQM implementation on SP is significantly greater in medium-sized firms compared to both small and large firms. This situation is also valid for the quadratic effect

of TQM on SP in medium-sized firms, where the increase is statistically significant compared to large firms.

Considering the findings, implementing effective talent management practices in business management will contribute to the long-term sustainability and performance of the business. Therefore, firms with widespread Total Quality Management (TQM) practices play a crucial role in creating a conducive environment for effective talent management. Consequently, companies that implement talent management practices alongside TQM practices will experience a mutually reinforcing positive impact on sustainability performance and the success of talent management practices.

7.2. Conclusion

This study examines the relationships between employees' perceptions of Total Quality Management (TQM) and Talent Management (TM) practices with Sustainable Performance (SP). For this purpose, data obtained from 339 managers and employees in the manufacturing sector in Istanbul, Yalova, and Kocaeli provinces were analyzed using partial least squares structural equation modelling. The findings indicate that an increase in the level of TQM implementation enhances both the level of TM practices and SP in organizations. Moreover, besides its direct effect, this increase in TQM level leads to an increase in both TM and SP through a quadratic effect. An increase in the level of TQM supports an increase in the level of TM practices. The study also observes that an increase in the level of TM practices significantly enhances SP, and the increase in TQM level further strengthens this interaction. Furthermore, the findings suggest that in terms of classification based on company size, the positive effect of an increase in TQM implementation on SP is significantly greater in medium-sized companies compared to small and large firms, and this holds for the quadratic effect as well.

7.3. Limitations and Suggestions for Future Research

The study was limited to certain provinces and manufacturing industries due to budget, time, and physical accessibility constraints. Therefore, the sample obtained does not represent all regions and sectors from an industrial perspective. For this reason, in terms of the Turkish sample, examining the relationships between the variables subject to study, especially in areas such as service, tourism, and financial institutions, due to their basic structure or involving different working conditions in different regions, will make significant contributions to the literature. Another important issue for similar studies is to examine how different environmental conditions and competition levels affect the relationships between variables.

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