



# IMPACT OF QUALITY MANAGEMENT AND SUSTAINABILITY ON ECONOMIC, ENVIRONMENTAL, AND SOCIAL ASPECTS OF HOTEL BUSINESS PERFORMANCE

## Abstract

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*Purpose* – The study explores the impact of Quality Management Systems (QMS) and sustainable development principles on the economic, environmental, and social aspects of hotel business performance.

*Methodology/Design/Approach* – The research was conducted in large and medium-sized hotel companies in Croatia. Chief Executive Officers (CEO), General Managers (GM), and their assistants completed in total 154 questionnaires. Exploratory factor analysis and Ordinary Least Squares (OLS) regression were applied.

*Findings* – The research results show that the adoption of QMS and sustainability principles significantly influences the economic, environmental, and social aspects of hotel operations. The research also identified key indicators for measuring and monitoring the effects of implementing these principles in hotels.

*Originality of the research* – The research identifies key factors of QMS and sustainable development principles implementation in hotel companies as well as their impact on all three aspects of hotel business performance – economic, environmental, and social. By identifying these factors and indicators for monitoring their impact on performance, the research contributes to the field by linking these dimensions to measurable outcomes.

**Keywords** QMS, sustainable development principles, hotel business performance-economic, environmental and social aspects

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## INTRODUCTION

Quality management in the hotel industry is a complex and multidimensional process, as it encompasses accommodation services, food and beverage services, and other complementary services that fulfil the tourist experience. To ensure their resilience in the ever-changing tourism market, hotel companies should customize their services to match and exceed the preferences of tourists. To achieve this, hotel companies have to apply and maintain a Quality Management System (QMS). The hospitality industry has recognized the importance of integrating QMS and sustainable development principles to enhance business performance. Hotels today operate in a highly dynamic and competitive environment where guests increasingly expect not only high-quality service but also responsible environmental and social practices. QMS (such as ISO 9001:2015) are designed to ensure that hotel companies consistently meet customer requirements and enhance satisfaction through continuous improvement and process standardization. In the context of tourism, QMS implementation is important for enhancing service quality and competitiveness. The integration of QMS and sustainable development principles can lead to improved operational processes (Boukeffa & Guelif, 2024), cost reductions (Perramon et al., 2022), and increased market attractiveness (Ionescu et al., 2018), particularly among environmentally and socially conscious guests.

Today's tourists are well-informed and environmentally conscious. They prefer and choose destinations and accommodation that offer new and unique experiences, such as meeting new people, exploring different cultures, local customs, gastronomy, and natural beauty of the places they visit. To meet the expectations of modern travellers, hotel companies need to implement the principles of quality management and sustainable development.

The primary objective of this study is to investigate whether the implementation of QMS and sustainable development principles affects the economic, environmental, and social dimensions of hotel business performance. To support this aim, the study seeks to examine perceptions of hotel managers (Chief Executive Officers (CEOs), General Managers (GMs), and their assistants and deputies) regarding the implementation of QMS principles and sustainable development principles. The research aims to assess how these principles influence hotel performance across three aspects: economic, environmental, and social. By employing multivariate statistical methods, the study seeks to identify the impact of QMS and sustainable development principles on various performance indicators, thereby contributing to a comprehensive understanding of their role in enhancing hotel business performance.

Based on the above, the following research questions have emerged: What is the purpose of implementing a QMS and sustainable development principles in hotel companies? What benefits do hotel companies gain by implementing a QMS and sustainability systems? Do large and medium-sized hotel companies in the Republic of Croatia implement QMS and sustainability systems? Building on these questions, this study investigates how the implementation of QMS and sustainable development principles influences various aspects of hotel business performance. Economic aspects include factors such as increased profitability, profits, revenues, average occupancy rates, and revenue per available room (RevPAR). In terms of environmental aspects, the study focuses on outcomes like waste reduction, reduced harmful emissions, and efforts toward environmental preservation. The social aspects explored in the study include improvements in employee satisfaction, better working conditions, and the contributions that hotel businesses make to their local communities through initiatives such as donations and sponsorships.

Research in this field have examined impact of either QMS principles or sustainability practices separately on all three aspects of hotel business performance (economic, environmental and social). This study addresses a gap by examining their combined implications and impact on all three aspects of hotel business performance. The obtained research results confirm that the study provides original empirical evidence, emphasizing that the integration of QMS and sustainable development principles may contribute to enhance the overall performance and competitiveness of large and medium-sized hotel companies.

## 1. LITERATURE REVIEW

The hospitality industry is facing growing demands to enhance its performance in economic, environmental, and social aspects. As environmental sustainability and social responsibility become increasingly pressing concerns, hotel companies are actively seeking methods to incorporate sustainable practices into their operations while keeping high standards of service quality. The integration of QMS and sustainable development principles has emerged as a strategic approach to achieving business excellence.

In this study, ISO 9001 was used as the framework for the implementation of the QMS as it provides a structured and internationally recognized framework for quality management that aligns with the goals of sustainable development. The significance of ISO 9001 lies in its potential to drive performance improvement not just in profitability (Firoiu et al., 2019) or customer satisfaction (Salas & Lorente, 2024), but also in community impact (Bohdanowicz & Zientara, 2009), all of which are central to sustainable business models. It helps the tourism sector to introduce high-quality services and create an image of sustainability (Azmaiparashvil, 2023, 7). Empirical results confirmed that the implementation of TQM practices has significant and positive impacts on sustainable performance, encompassing economic, environmental, and social performance (Sin et al, 2022). This study examines the relationship between sustainability and QMS within the hospitality sector. The following literature review examines previous research regarding the implementation of QMS and sustainable development principles in hotel companies, with a focus on their impacts across the three sustainability pillars: the economic, environmental, and social aspects.

### 1.1. Impacts of QMS implementation in hotels

QMS principles, in particular those guided by ISO 9001:2015, have been widely adopted in hotel companies. Various authors have emphasized the role of QMS implementation on customer satisfaction (Allen & Klimann, 2001; Tari et al., 2022; Salas & Lorente, 2024; Azáldegui-Cárdenas et al., 2023; Milovanović et al., 2023), as well as the relationship between customer orientation and business performance (Shugdra et al., 2025), and explored the relationship between QMS and financial outcomes (O'Neill, Sohal & Teng, 2016; Roca-Puig & Escrig-Tena, 2017; Thuy & Anh, 2025; Thuy & Hue, 2023), operational performance (Bakhtiar et al., 2023) and overall business performance (Van Nguyen & Ngoc, 2024). Kaur et al. (2024) showed that quality is a key driver of sustainability, providing a common foundation for improving environmental, social, and economic outcomes.

### 1.2 Impacts of sustainable development principles in hotels

Sustainable development in hotels represents a strategic orientation towards reducing environmental footprint, fostering social responsibility, and ensuring economic viability. Various authors have emphasized the role and impact of sustainable development principles on the economic and environmental aspects of hotel business performance. Key themes include energy savings, waste reduction, and fair labour practices. Langgat et al. (2023) confirmed that the implementation of sustainable development practices has a positive impact on the economic and environmental aspects. Li & Zainal (2025) confirmed that hotels that adopt environmentally sustainable practices and transparently share their environmental management efforts can improve their performance. Dwivedi et al. (2022) confirmed that the implementation of green practices in hotels can positively impact hotel's image. Barakagira & Paapa (2024) confirmed that the implementation of environmental sustainability practices positively impacts the economic aspects of hotel business performance (cost reductions). Yu et al. (2024) confirmed that there is a positive relationship between environmental, social, and governance factors, and brand involvement and brand choice. Other authors also highlight significant reductions in energy and water consumption, lower greenhouse gas emissions, and more effective waste management (Arocena, Orcos & Zouaghi, 2021; Mungai, Ndiritu & Rajwani, 2020; Yu et al., 2021; Guruge, 2022; Kassim, 2023; Suárez-Fernández et al., 2025; Guerra-Lombardi et al., 2024; Periša, 2024; Mendoza et al., 2023).

### 1.3. Impacts of QMS and sustainable development principles in hotels

Despite the extensive research on QMS and sustainable development principles, most studies focus on only one aspect of sustainability, such as the economic aspect. Perramon et al. (2022) confirmed that sustainability practices and service quality practices positively influence hotels' financial performance and competitiveness. Loedphacharakamon & Worakittikul (2025) confirmed that adopting sustainability practices and QMS positively impacts the economic and environmental aspect of hotel business performance. Duyen et al. (2025) confirmed that the implementation of Corporate Social Responsibility (CRS) enhances the economic and environmental aspects of hotel business performance. Studies have also confirmed the positive impact of implementing an integrated management system (IMS) on business performance, covering its economic, environmental, and social aspects (Nguyen, Phan & Matsui, 2018; Ferreira, Poltronieri & Gerolamo, 2019). Morgan et al. (2024) confirmed that a strong culture of environmental orientation, effective quality management practices, and substantial sustainability experiences can positively impact the sustainability performance in the economic, environmental, and social dimensions as well as on the organizational green practices in service industry. Despite the growing interest in QMS and its influence on sustainable performance, there is still a lack of studies examining its impact across all three sustainability dimensions - economic, environmental, and social.

Based on the points mentioned above, the primary hypothesis is stated as follows: "The implementation of QMS and sustainable development principles has a statistically significant impact on the economic, environmental, and social aspects of hotel business performance." The following auxiliary hypotheses are derived from the main scientific hypothesis:

H1: The adoption of QMS and sustainable development principles leads to measurable improvements in the economic performance of hotels' businesses.

H2: The integration of QMS and sustainable development principles contributes to the enhancement of the environmental performance of hotel businesses performance.

H3: The implementation of QMS and sustainable development principles fosters positive changes in the social performance of hotel businesses performance.

## 2. METHODOLOGY

The research focused on active hotel companies in Croatia, classified by law (Accounting Act) as large or medium-sized companies, and grouped according to the National Classification of Activities under "Hotels and similar accommodation". The target population consists of CEOs, GMs who manage the accommodation facilities operating within these companies, and their assistants and/or deputies. The study population consists of 374 managers and/or assistants, and a simple random sampling method was used. The minimum required sample size was calculated using GPower software. The multiple regression method was chosen as a statistical test, and the number of independent variables was entered, 10 in total (consisting of 7 QMS principles and 3 sustainable development principles). Additionally, a minimum statistical power of 0.80 was set. Based on these inputs, the software determined that the minimum acceptable sample size is 118 respondents. According to Sapnas & Zeller (2002), a sample size between 50 and 100 is recommended for measuring social constructs, while Gorsuch (1983) suggests having at least 100 respondents for factor analysis.

A structured questionnaire was developed. In designing the questionnaire to ensure a broad and well-rounded theoretical foundation for the research different sources were used. The questionnaire was distributed to respondents via a Google Forms template. The empirical research was conducted in two phases. The initial phase, a pilot study to test the structured questionnaire, was conducted in May 2023 in two large hotel companies in Croatia. The pilot questionnaire consisted of 78 questions, 77 of which were close-ended, while the final question was open-ended, seeking suggestions for improving the questionnaire. A total of 31 questionnaires were collected in the pilot study. The collected data was analysed using an exploratory factor analysis.

Based on the results of the pilot study, the questionnaire was revised and finalized to include a total of 60 questions. The final version was organized into four parts. The first part consisted of 9 questions aimed at gathering socio-demographic information about the respondents as well as details about the company profiles. The second part included 24 questions, focused on exploring respondents' perceptions regarding the application of quality management principles within the hotel company. The questions were designed to cover the implementation of all principles of a QMS (Kanji, 2002; Nguyen et al., 2018; Alsawafi et al., 2019; Bouranta et al., 2017; Montesino, 2002; Ho et al., 1999; Tari et al., 2020; Fuentes-Fuentes et al., 2004; Sanchez-Lizarraga et al., 2020; Pertusa-Ortega et al., 2021; Rahman, 2001; Quazi & Padibjo, 1998; Phan et al., 2011; Kanji & Wong, 1999). The third part comprised 12 questions that examined how respondents perceived the application of sustainable development principles in the hotel company. Questions were designed to elicit respondents to identify which sustainable practices were being implemented. These were categorized into economic, environmental, and social practices, thus encompassing all principles of sustainable development (Benavides-Velasco et al., 2014; Dabija & Băbuș, 2013; Claver-Cortés et al., 2007). The fourth and final part contained 15 questions focused on exploring respondents' perceptions regarding the adoption of both quality management and sustainable development principles and their impact on the economic, environmental, and social aspects of hotel business performance. The questions were structured to assess how the implementation of a QMS and sustainable development principles impacts the economic, environmental, and social aspects of business performance (Nguyen et al., 2018; Claver-Cortés et al., 2007; Pamfilie et al., 2018; Benavides-Velasco et al., 2014; Tari et al., 2020; Wong et al., 2021). The questions in Parts 2, 3, and 4 were structured as statements. Respondents rated their level of agreement on a Likert scale from 1 to 5.

### 3. RESULTS

The study was conducted in May and June 2023. All data presented in this study were collected from primary sources through an online questionnaire. A total of 154 surveys were gathered (representing 41.17% of the total population).

#### 3.1. Demographics

Table 1 presents the socio-demographic and the professional characteristics of the respondents.

Table 1: Socio-demographic and professional characteristics of the sample

| Characteristics                                     | N = 154  |              |
|---|----------|--------------|
| <b>Gender</b>                                       | <b>N</b> | <b>Share</b> |
| Male  | 80       | 52.00%       |
| Female  | 74       | 48.00%       |
| <b>Level of education</b>                           | <b>N</b> | <b>Share</b> |
| Secondary education (less than 3 years)             | 1        | 0.65%        |
| Secondary education (less than 4 years)             | 2        | 1.30%        |
| Secondary education (4 years or more)               | 17       | 11.04%       |
| Undergraduate university/professional study         | 18       | 11.69%       |
| University/specialist professional graduate studies | 57       | 37.01%       |
| Postgraduate specialist degree                      | 55       | 35.71%       |
| Postgraduate master's degree in science             | 4        | 2.60%        |
| <b>Size of the hotel company</b>                    | <b>N</b> | <b>Share</b> |
| Large hotel companies                               | 115      | 74.68%       |
| Medium-sized hotel companies                        | 39       | 25.32%       |
| <b>Type of accommodation</b>                        | <b>N</b> | <b>Share</b> |
| Hotels  | 80       | 51.95%       |
| Campsites   | 44       | 28.57%       |
| Resorts   | 30       | 19.48%       |
| <b>Position held</b>                                | <b>N</b> | <b>Share</b> |
| GM  | 91       | 59.09%       |
| GM Deputy or assistant                              | 57       | 37.01%       |
| CEO   | 4        | 2.60%        |
| CEO Deputy or assistant                             | 2        | 1.30%        |
| <b>Years in their current position</b>              | <b>N</b> | <b>Share</b> |
| 0-5 years   | 44       | 28.57%       |
| 6-10 years  | 57       | 37.01%       |
| 11-15 years   | 21       | 13.64%       |
| 15 years or more                                    | 32       | 20.78%       |

Source: Author's research

Table 1 presents the gender distribution of the study sample, comprising a total of 154 participants. There were more male participants (52.00%) than female participants (48.00%) in the study. In terms of education level, the majority of respondents have a bachelor's degree. The highest number of respondents were employed in large hotel companies (74.68%), in the position of GM (59.09%) between six and ten years (37.01%). The majority of the respondents are engaged in managing hotels (51.95%).

Table 2: **Implementation of ISO standards in large and medium-sized hotel companies**

| <b>Characteristics</b>                | <b>N = 154</b> |
|---------------------------------------|----------------|
| <b>Implementation - ISO standards</b> | <b>Share</b>   |
| ISO 14001:2015                        | 29.83%         |
| ISO 22000:2018 (HACCP)                | 26.18%         |
| ISO 9001:2015                         | 23.61%         |
| ISO 50001:2018                        | 13.09%         |
| ISO 45001:2018                        | 5.58%          |
| ISO 26000:2010                        | 1.72%          |

Source: Author's research

The results from the table above provide evidence that sustainability standards and QMS have been adopted by large and medium-sized hotel companies.

### 3.2. Analysis

To test the proposed auxiliary hypotheses, an exploratory factor analysis was conducted for each construct as a first step, followed by a regression analysis. Three exploratory factor analyses were conducted to gain insights from the respondents' perspectives. The first analysis (Exploratory Factor Analysis 1) focused on identifying the factors that best represent the adoption of quality management principles within hotel companies. The second analysis (Exploratory Factor Analysis 2) aimed to determine the factors that most accurately reflect the implementation of sustainable development principles in hotel companies. Finally, the third analysis (Exploratory Factor Analysis 3) explored which factors best define the impact of QMS and sustainable development principles on the economic, environmental, and social aspects of hotel business performance.

To assess the fitness of the data for factor analysis, both the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test were performed. The KMO test value for all three exploratory factor analyses was above 0.600 (0.8 for Exploratory Factor Analysis 1, 0.696 for Exploratory Factor Analysis 2, and 0.726 for Exploratory Factor Analysis 3), and Bartlett's test significance was established for all three factor analyses (sig. = 0.000), confirming that the collected data meet the criteria for factor analysis. Below are the generated dimensions (factors) resulting from the exploratory factor analyses, along with their total variance.

Table 3: **Analysis of the reliability and total variance of the generated dimensions**

| <b>Exploratory Factor Analysis 1</b> |  |            |              |                  |            |
|--------------------------------------|--|------------|--------------|------------------|------------|
| Factors                              |  | Eigenvalue | Cumulative % | Cronbach's Alpha | N of Items |
| I                                    | Leadership focused on evidence - based decision making | 4.413      | 33.947       | .743             | 5          |
| II                                   | Engagement of people                                   | 1.598      | 46.238       | .710             | 5          |
| III                                  | Quality improvement                                    | 1.275      | 56.046       | .752             | 3          |
| <b>Exploratory Factor Analysis 2</b> |  |            |              |                  |            |
| Factors                              |  | Eigenvalue | Cumulative % | Cronbach's Alpha | N of Items |
| I                                    | Economic and social practices                          | 3.266      | 32.657       | .724             | 6          |
| II                                   | Environmental practices                                | 1.829      | 50.95        | .776             | 4          |
| <b>Exploratory Factor Analysis 3</b> |  |            |              |                  |            |
| Factors                              |  | Eigenvalue | Cumulative % | Cronbach's Alpha | N of Items |
| I                                    | Economic aspects of business performance               | 3.197      | 35.52        | .843             | 3          |
| II                                   | Environmental aspects of business performance          | 1.852      | 56.103       | .811             | 3          |
| III                                  | Social aspects of business performance                 | 1.544      | 73.261       | .762             | 3          |

Source: Author's research

The exploratory factor analyses resulted in a total of eight dimensions (factors), each explaining more than 50.00% of the total variance. In Exploratory Factor Analysis 1, a total of three factors were extracted: the first factor was “Leadership focused on evidence-based decision making“, which integrates three principles: leadership, process approach to management, and fact-based decision making; the second factor was “Engagement of people“, combining the principles of people’s involvement, process approach to management, and continuous improvement, and the third factor was “Quality improvement“, which integrates the principles of people’s involvement and continuous improvement. (Periša & Vrtodušić Hrgović, 2024). In Exploratory Factor Analysis 2, two factors were identified. The first was “Economic and social practices“, which combined questions related to both economic and social practices. The second factor was “Environmental practices“, which encompassed questions pertaining to environmentally sustainable practices. In Exploratory Factor Analysis 3, three factors were extracted. The first was “Economic aspects of business performance“, addressing questions related to the economic aspects of business. The second was “Environmental aspects of business performance“, which focused on questions concerning the environmental aspects. The third factor was “Social aspects of business performance“, encompassing questions related to the social dimensions of business performance. To assess the reliability of each identified factor, Cronbach’s alpha coefficient was calculated. Cronbach’s alpha coefficient varied from 0.710 to 0.811, confirming the reliability of each dimension.

To validate the established auxiliary hypotheses, multiple regression analysis was employed. Since this research involves multiple independent variables that influence the dependent variables, the Ordinary Least Square (OLS) regression model was applied. The independent variables in the regression model consist of the factors derived from the first and second exploratory factor analyses (1 and 2), while the dependent variables consist of the factors derived from the third exploratory factor analysis (3). To confirm the auxiliary hypotheses, three regression models were created to examine the impact of composite variables related to the implementation of QMS and sustainable development principles on the economic aspects of business performance (Model 1), environmental aspects of business performance (Model 2), and social aspects of business performance (Model 3) in hotel companies.

Figure 1: Conceptual framework for OLS regression analysis



Source: Author’s research

OLS regression is used to analyse parameters in multiple linear regression and is based on minimizing the sum of squared random errors. In order to be valid and adequate, the OLS regression model must meet the following assumption: the absence of multicollinearity and heteroscedasticity. To detect multicollinearity within a regression model, the Variance Inflation Factor (VIF) test is applied where a VIF value greater than 10 indicates strong multicollinearity while the Breusch–Pagan test is performed to detect heteroscedasticity. The presence of heteroscedasticity means that the variances of the residuals in the regression model are not constant over the entire range of values of the independent variables, which can lead to issues with the accuracy of the coefficient estimates and standard errors. If multicollinearity and/or heteroscedasticity are present, the model should be adjusted using robust standard errors. The results of the VIF test and Breusch-Pagan test are shown in the tables below (Table 5 and Table 7).

Table 4: Regression Models 1, 2, and 3 – Correlation Coefficients

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .342 <sup>a</sup> | 0.117    | 0.087             | 0.69266                    |
| 2     | .476 <sup>a</sup> | 0.227    | 0.201             | 0.66484                    |
| 3     | .379 <sup>a</sup> | 0.144    | 0.115             | 0.78083                    |

Source: Author’s research

The table shows a moderate statistical correlation between the predictors and the economic aspects of hotel business performance ( $R = 0.342$ ), the environmental aspects of hotel business performance ( $R = 0.476$ ), and the social aspects of hotel business performance ( $R = 0.379$ ). The  $R^2$  indicator represents the most commonly used measure for the representativeness of regression models. It is evident that  $R^2$  in Model 1 is 0.117, indicating that 11.70% of the variance in the dependent variable (economic aspects of hotel business performance) is explained by the variances of the independent variables.  $R^2$  in Model 2 is 0.227, indicating that 22.70% of the variance in the dependent variable (environmental aspects of hotel business performance) is explained by the variances of the independent variables.  $R^2$  in Model 3 is 0.144, indicating that 14.40% of the variance in the dependent variable (social aspects of hotel business performance) is explained by the variances of the independent variables. A value of  $R^2$  closer to 0 may indicate that the model is deficient due to omitted variables. To investigate this further, a RESET test was conducted for each regression model.

Table 5: RESET Test (Regression Models 1, 2, and 3)

| Model | F     | Prob. > F | $\chi^2$ | Prob > $\chi^2$ |
|-------|-------|-----------|----------|-----------------|
| 1     | 1.18  | 0.3186    | 5.18     | 0.028           |
| 2     | 0.730 | 0.5382    | 1.40     | 0.236           |
| 3     | 0.700 | 0.5552    | 0.09     | 0.762           |

Source: Author's research

The Breusch-Pagan test ( $\chi^2 = 5.18$ ) revealed heteroscedasticity in the first regression model, necessitating a model correction. Conversely, the Breusch-Pagan test for the second and third regression model ( $\chi^2 = 1.40$  and  $\chi^2 = 0.09$ ) showed no evidence of heteroscedasticity. The results of the conducted RESET test indicate that all regression models are well specified and that no omitted variables were detected. To confirm the hypotheses using regression methods, it is crucial to assess the overall significance of each regression model. To test this, it is necessary to apply the ANOVA method, specifically to determine the significance of the F-test results for each defined regression model.

Table 6: ANOVA – Analysis of Variance for Regression Models 1, 2, and 3

| Model | F     | Sig.  |
|-------|-------|-------|
| 1     | 3.927 | 0.002 |
| 2     | 8.678 | 0.000 |
| 3     | 4.977 | 0.000 |

Source: Author's research

The F-test results in the presented regression models are significant, with a significance level less than 0.05, confirming that the models are overall significant. Based on the F-test results and the confirmed significance of the overall regression models (1, 2, and 3), it can be inferred that all auxiliary hypotheses have been validated, indicating that the implementation of QMS and sustainable development principles significantly influences the economic, environmental, and social aspects of hotels' business performance. One of the prerequisites for performing OLS regression is the absence of multicollinearity in the model, which is assessed by analysing the VIF indicator. In the presented regression model, the VIF values range from 1.177 to 1.480, indicating that multicollinearity has not been detected in the regression model.

Table 7: Regression Analysis Results: Coefficients and Collinearity Diagnostics (Model 1, Model 2, and Model 3)

| Model | B          | Unstandardized Coefficients |        | Standardized Coefficients | t      | Sig. Tolerance | Collinearity Statistics |       |
|-------|------------|-----------------------------|--------|---------------------------|--------|----------------|-------------------------|-------|
|       |            | Std. Error                  | Beta   |                           |        |                | VIF                     |       |
| 1     | (Constant) | 1.499                       | 0.77   |                           | 1.948  | 0.053          |                         |       |
|       | V_1_1      | 0.295                       | 0.1384 | 0.219                     | 2.130  | 0.035          | 0.678                   | 1.474 |
| 2     | (Constant) | - 0.458                     | 0.739  |                           | - 0.62 | 0.536          |                         |       |
|       | V_2_1      | 0.403                       | 0.144  | 0.246                     | 2.8    | 0.006          | 0.675                   | 1.480 |
|       | V_2_2      | 0.558                       | 0.133  | 0.329                     | 4.193  | 0.000          | 0.85                    | 1.177 |
| 3     | (Constant) | 0.547                       | 0.868  |                           | 0.63   | 0.53           |                         |       |
|       | V_1_3      | 0.256                       | 0.103  | 0.228                     | 2.48   | 0.014          | 0.686                   | 1.458 |
|       | V_2_2      | 0.351                       | 0.156  | 0.185                     | 2.247  | 0.026          | 0.85                    | 1.177 |

Source: Author's research

In the presented regression models, multicollinearity was not detected, as all VIF test results range from 1.177 to 1.480. Furthermore, analysing the values and significance of the regression coefficient ( $\beta$ ) of the independent variables in the regression models reveals the following results. In Model 1, the independent variable V\_1\_1 (Leadership focused on evidence-based decision-making) has a  $\beta$  coefficient of 0.295, which is positive, and its significance is established at the 5% level. In Model 2, the independent variable V\_2\_1 (Economic and social practices) has a  $\beta$  coefficient of 0.403, which is also positive and significant at the 5% level. Additionally, in the same model, the independent variable V\_2\_2 (Environmental practices) has a  $\beta$  coefficient of 0.558, which is positive and significant at the 5% level. In Model 3, the independent variable V\_2\_2 (Environmental practices) has a  $\beta$  coefficient of 0.351, and the independent variable V\_1\_3 (Quality improvement) has a  $\beta$  coefficient of 0.256. Both coefficients are positive, and significance for each is established at the 5% level.

### 3.3. Discussion

The research results confirm that the implementation of QMS and sustainable development principles have a statistically significant impact on the economic, environmental and social aspects of hotel business performance. Furthermore, the research results confirm that the large and medium-sized hotel companies implement QMS and sustainable development principles to obtain measurable achievements in the economic, environmental and social aspect of hotel business performance. The integration of QMS and sustainable development contributes in creating a framework to improve efficiency and corporate responsibility.

The independent variable V\_1\_1, Leadership focused on evidence-based decision-making, in regression Model 1 represents a composite variable that combines three principles of quality management according to ISO standard 9000:2015, namely: leadership, a process approach to decision-making, and fact-based decision-making. The findings of the conducted research have demonstrated the significant influence of this independent variable (V\_1\_1) on the economic aspects of hotel business performance. This means that changes in this independent variable have the greatest effect on enhancing the economic aspects of hotel business performance. In this study, the economic aspects of hotel business performance were monitored through the participants' perception of the increase in key performance indicators of hotel companies, specifically: RevPAR, sales revenue, average occupancy rate, and business profitability.

Based on this data, it is evident that the respondents consider the implementation of a QMS, which positively affects economic aspects of hotel business performance, are dependent on the following principles: leadership, evidence-based decision-making, and a process-oriented management approach. The results of this research can be compared with those of previous studies, where authors demonstrated that the implementation of the leadership principle, among all principles of quality management, most significantly influences the economic aspects of hotel business performance (Sunil et al., 2021; Androniceanu, 2017) and that employee involvement positively affects the economic aspects of business performance (Sunil et al., 2021; Fullinfaw & Sunil, 2019; Androniceanu, 2017). Therefore, it can be concluded that respondents are aware that a crucial element for enhancing the economic aspects of hotel business performance is the role of hotel management, focusing on quality, taking responsibility for quality, and making decisions based on facts.

An analysis of each independent variable reveals that in regression Model 2, two independent variables are significant: V\_2\_2 (Environmental practices) and V\_2\_1 (Economic and social practices). Given the positive value of the regression coefficient and established significance at a level of 5%, it can be concluded that an increase in these variables positively and significantly contributes to enhancing the ecological aspects of hotel business performance. The results of this research reflect patterns identified in previous studies (Kularatne et al., 2019; Pereira-Moliner et al., 2012; Khalil et al., 2024; Sakshi et al., 2020), validating that the adoption of sustainable practices has a statistically significant impact on the environmental aspects of hotel business performance.

An analysis of each independent variable shows that in regression Model 3, two independent variables are significant: V\_2\_2 (Environmental practices) and V\_1\_3 (Quality improvement). The independent variable V\_1\_3 is a composite variable that encompasses issues from two principles of quality management, namely: the principle of employee involvement and continuous improvement. The principle of "continuous improvement" in this case involves educating employees about the QMS, quality policy, and raising employee awareness about quality. It can be concluded that, according to the respondents' perception, large and medium-sized hotel companies that implement environmentally sustainable practices, raise employees' awareness of the QMS, and educate employees about the QMS have a positive influence on the social aspects of hotel business performance, as reflected in increased employee satisfaction, motivation, and improved working conditions. The findings of this research reflect patterns identified in previous studies. Chen et al. (2018) demonstrated that the application of environmental practices can positively affect the social aspects of business performance (increasing employee retention) and reduce costs; the authors Khalil et al. (2024) confirmed that the application of sustainable practices in hotels positively impacts all aspects of sustainable hotel management.

## CONCLUSION

The primary research, conducted through an online structured questionnaire, has shown that QMS and sustainable development principles are integrated into the operations of hotel companies in Croatia. Furthermore, the implementation of these principles positively influences the economic, environmental and social aspects of hotel business performance. In the study, all constructs were created following theoretical frameworks. The sustainable development principles are theoretically divided into economic, environmental and social dimensions, and their implementation in the hotels is monitored through sustainable practices. All sustainable development principles were encompassed within the primary research. Additionally, the research included all principles defined by ISO standard 9000:2015 (leadership, customer focus, employee involvement, process approach, continuous improvement, evidence-based decision-making, and relationship management).

An online questionnaire was used to conduct the primary research, and a total of 154 responses were collected. By applying exploratory factor analysis, factors were generated that, according to the participants' perceptions, determined the constructs of the research (QMS principles, sustainable development principles, and economic, environmental and social aspects of hotel business performance). To validate the defined auxiliary hypotheses, multiple linear regression (OLS) was employed. Three regressions were conducted, one regression model for each auxiliary hypothesis. According to the results of the multiple linear regression and the confirmed relevance of each regression model (F-test results), as well as the presence of significant variables in each regression model, all three auxiliary hypotheses were confirmed, thereby validating the main hypothesis. The research results indicate that the respondents are aware that the implementation of QMS and sustainable development principles can positively impact the enhancement of the economic, environmental, and social aspects of hotel performance. The research identified the QMS principles and sustainable development practices that, according to the participants' perceptions, significantly influence the economic, environmental, and social aspects of hotel business performance. Therefore, it can be concluded that the research findings provide hotel managers with a credible resource for their decision-making process.

### Theoretical and empirical implications of the study

Interest in quality management and sustainable development within the hotel industry is growing. However, most of the existing literature and studies on the implementation of QMS and sustainable development principles in hotels focus on one practice at a time. Therefore, this study contributes to the existing literature by identifying the key dimensions of QMS and sustainable development principles implementation in hotel companies as well as their impact on all three aspects of hotel business performance – economic, environmental, and social. From a theoretical perspective, this study contributes to the growth of knowledge in the field of quality management and sustainable development and promotes the advancement of scientific discourse that connects quality management principles with sustainable development principles and examines their effects on the economic, environmental, and social aspects of hotel business performance. Additionally, the study expands the theoretical knowledge in both quality management and sustainable development, broadening the understanding of how these principles affect the economic, environmental, and social aspects of hotel operations. The results of the study confirm the validity of the methodology used in the research and analysis as well as the validity and reliability of the measurement instrument designed to evaluate the implementation of QMS and sustainability principles. Furthermore, the instrument captures their influence on the economic, environmental and social aspect of business performance within the hotel industry. Moreover, the findings from the conducted scientific research highlight the dimensions of quality management and sustainable development principles that, according to the respondents' perceptions, significantly influence the economic, environmental, and social aspects of operations, providing the empirical contribution of the research. The research findings contribute to the literature by offering theoretical implications and providing answers to the following research questions: What are the implications of the QMS and sustainable development principles implementation in hotel companies in Croatia? To what extent does the QMS and sustainable development principles implementation lead to sustainable performance? To what extent do the hotel's quality management and environmental practices impact all aspects of hotel business performance? By integrating QMS with sustainability principles, the study highlights how hotel companies can move beyond compliance and create long-term value.

### Practical implication of the study

The applied contribution of the study is reflected in the potential use of its findings in hotel management practices. The results of the study identify the key indicators that can be used to measure and monitor the effects of the implementation of quality management and sustainability principles in hotel operations, focusing on the economic, environmental, and social aspects of hotel operations. The study's results reveal the sustainable development practices adopted and the QMS principles implemented in large and medium-sized hotel businesses. It also identified the quality management and sustainable development factors whose application has an impact on the economic, environmental and social aspects of hotel operations. Results can help hotel managers to understand the extent to which the principles of QMS and sustainable development influence all aspects of hotel business performance. Hotel managers should take into account that QMS and sustainable development principles have a positive impact on the economic aspect of hotel business performance such as financial performance and organizational performance, and at the same time can attract more environmentally conscious tourists. From the results, hotel managers can evaluate the extent to which QMS and sustainable development principles influence each aspect of hotel business performance (economic, environmental and social). The research findings can help hotel managers create guidelines for the successful integration of QMS and sustainable development principles into business practices.

## Limitations and future directions

When analysing the results of the empirical research, certain limitations must be considered. Although the collected representative sample is significant and sufficiently large, the empirical research was conducted in large and medium-sized hotel companies in Croatia, excluding of small and micro hotel companies. In addition, not all levels of management were represented (the respondents were CEOs, GMs and their deputies and/or assistants). Taking these limitations into account, several suggestions for future research can be made. For future studies, it is advisable to include all levels of management in hotel companies and to broaden their scope to include all hotel businesses in the Republic of Croatia. To examine and analyse potential differences in the perceptions of key stakeholders, future research should investigate the views of hotel management, employees, guests, and the local community. The empirical research could be extended by utilizing similar methodologies to cover all businesses within the tourism sector.

## DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

In preparing this paper, the author(s) used [ChatGPT] for to improve the readability and language of the manuscript. Following the use of this tool/service, the author(s) have reviewed and edited the content as necessary and take full responsibility for the content of the published article.

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