

Monitoring the Connection Between the Application of EFQM Model Principles and the Results of Organisations

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ABSTRACT

Purpose: The present paper evaluated the connections between the degree of fulfilment of the EFQM model's requirements and the organisation's size, key results, social responsibility, employee satisfaction and customer satisfaction.

Methodology/Approach: The dataset was acquired via an internet-based survey hosted on Google Forms. The survey targeted managerial personnel within manufacturing entities situated within the geographical boundaries of the Czech Republic.

Findings: Research on the relationship between the degree of fulfilment of the EFQM model requirements and the organisation's size, critical organisational results, social responsibility, employee satisfaction, customer satisfaction and overall organisational results demonstrated a moderately significant to strong correlation for all monitored indicators.

Research limitation/implication: The data is collected only in one specific country, but the production organisations in which the research was carried out are mainly foreign-owned.

Originality/Value of paper: The current research results offer practical and theoretical implications. Theoretically, the research expands the literature on the EFQM model and its connection with current trends, which are the higher innovative activity of organisations and correlation with Industry 4. Practically, the research results will benefit managers, directors, and leaders of companies by allowing them to maintain an optimal level of quality management and estimate future requirements for complex enterprise integration.

Category: Research paper

Keywords: EFQM Model; quality management; standard; improvement

Research Areas: Quality Management, Strategic Quality Management

1 INTRODUCTION

Companies need to use strategic management models to maintain power over their competitors in the current competitive environment. Maintaining high performance and ensuring long-term profitability and sustainability is still one of the significant challenges facing managers of organisations. (Efimova and Briš, 2021)

Managerial models of business excellence define core strategic competencies that enable businesses to secure sustainable competitive advantage through self-assessment. It is imperative that the models also need to be improved over time, as do standards such as the ISO 9000 series.

The EFQM model can be a tool or, better said, a guide to achieving excellence in an organisation. The organisation objectively determines its position on the excellence scale to identify its strengths and weaknesses.

The EFQM Model is applied in various forms in more than 50,000 organisations worldwide. (Bocoya-Maline et al., 2023). However, in the Czech Republic, it remains far in the background and, in most cases, completely unnoticed (Nenadál et al., 2018). This paper focuses on the management systems of organisations operating in the Czech Republic. In the questionnaire survey, managers of organisations comment on all the requirements of the EFQM model.

All organisations must be managed. Top management is gradually creating its framework for the management system, which applies primarily to more giant corporations. However, it is also advantageous to use support tools that can help lead organisations to successful results. This applies to all sectors regardless of size or structure. The EFQM model is one such tool that helps manage organisations in the form of so-called self-assessment. The gradual application of this tool makes it possible to assess the degree of perfection of the managed system or to discover its strengths and weaknesses or shortcomings in the sense of the declared visions, missions and strategic goals. Thanks to the EFQM model, communication in the organisation can be improved and better specified because the model brings an original vocabulary and way of thinking. Thanks to the EFQM model, planning existing or future activities can be optimised, and duplications and other forms of waste can be avoided.

Although numerous management tools and methodologies are commonly used, the EFQM model offers a comprehensive view of the organisation and can help clarify the interrelationships and synergistic potential between these different methods. All organisations strive to be successful. Some end up in failure, others achieve short-term success. Only a select few realise lasting prosperity and gain the respect and admiration they deserve.

1.1 The principle of organisational excellence

Excellence in an organisation is defined as the way an organisation is managed to achieve exceptional results in all aspects of the company. These extraordinary

results can be achieved through the use of knowledge and skills from the practices of the most successful and high-performing organisations in the world, the so-called best practices (Sanders, 2017). There is also debate in the professional community as to whether the EFQM model should be adapted for specific industries.

1.2 The impact of excellence on the performance of organisations

Since its introduction, the EFQM model has been recognised as a global structure that supports organisations of any nature, sector or dimension in managing change and improving organisational performance (Fonseca, 2022).

Regardless of the business sector, size or organisational structure, a company needs to have a proper management framework in place. The EFQM model can be a voluntary framework (Yousaf and Briš, 2019).

This framework provides a holistic view of the company. It enables them (Yousaf and Briš, 2019) To assess where they are in their journey to excellence, helping them identify and understand their strengths and weaknesses relative to their identified vision, strategy and mission. The framework mentioned above will ensure the following:

- Creating consistent terminology and ways of thinking facilitates communication within the organisation and the communication of ideas.
- Preparation of the primary structure for the management system.
- Bringing together existing and planned proposals while eliminating duplication and identifying gaps.

Organisations that we label as excellent cannot only achieve but also sustain an excellent level of performance that meets or exceeds the expectations of all their stakeholders (Yousaf and Briš, 2019).

1.3 Examples of models of excellence

The most common Business Excellence models include:

- EFQM Model of the European Foundation for Quality Management – Used throughout Europe
- Canadian Model of Business Excellence – Canada
- Singapore Quality Award Model – Singapore
- Japanese Quality Award Model – Japan
- Australian Business Excellence Framework (ABEF) – Australia
- Baldrige (MBNQA) – Used in more than 25 countries, including the USA and New Zealand

1.4 Model EFQM

The model enables three key objectives to be achieved (Mirhosseini, 2012). In addition to identifying strengths, it also highlights areas for improvement. Last but not least, the model highlights projects and programs with the help of which the organisation can start the journey to excellence.

Exemplars of excellence models necessitate periodic scrutiny to ensure alignment with evolving environmental factors, market dynamics, and technological advancements, as underscored by Gunasekaran (2019). Building upon this, Dodangeh (2011) asserted that, despite the widespread utilisation of the EFQM framework in Europe and worldwide, it is imperative to adapt earlier iterations of the model to accommodate recent shifts in business paradigms and market landscapes. Consequently, the EFQM model has undergone systematic revisions to sustain its pertinence and utility. Through a collaborative endeavour encompassing EFQM constituents, previous award recipients, partners, scholars, trainers, and consultants, the version of 2013 culminated in formulating the EFQM 2020 model (Fonseca, 2022). Furthermore, the model's 2021 iteration integrated the United Nations Sustainable Development Goals (SDGs) and incorporated facets of business ethics. The re-evaluation of the EFQM model was guided by the imperative to concurrently manage change and operations while fostering more collaborative leadership and innovative ideation, reinforced by disruptive thinking. This recalibration aims to empower organisations to adapt to future exigencies. The EFQM 2020 model is anticipated to bolster organisational agility in responding to opportunities and threats, ultimately optimising performance. The EFQM 2020 model was founded on the articulation of three fundamental inquiries, denoted as follows: Firstly, "Why" encompasses an exploration of the organisation's *raison d'être* and its underlying purpose, delving into the rationale behind its chosen strategies, thus elucidating the overall direction. Secondly, "How" delves into the tactical execution of its purpose and strategy, delineating how the organisation intends to realise its objectives, thereby underscoring the realm of implementation. Finally, the question "What" delves into an assessment of the actual accomplishments realised to date, in tandem with a vision of what the organisation aspires to achieve in the future, emphasising the realm of results.

Figure 1 shows the three critical parts of the new framework: Results, Execution and Direction.

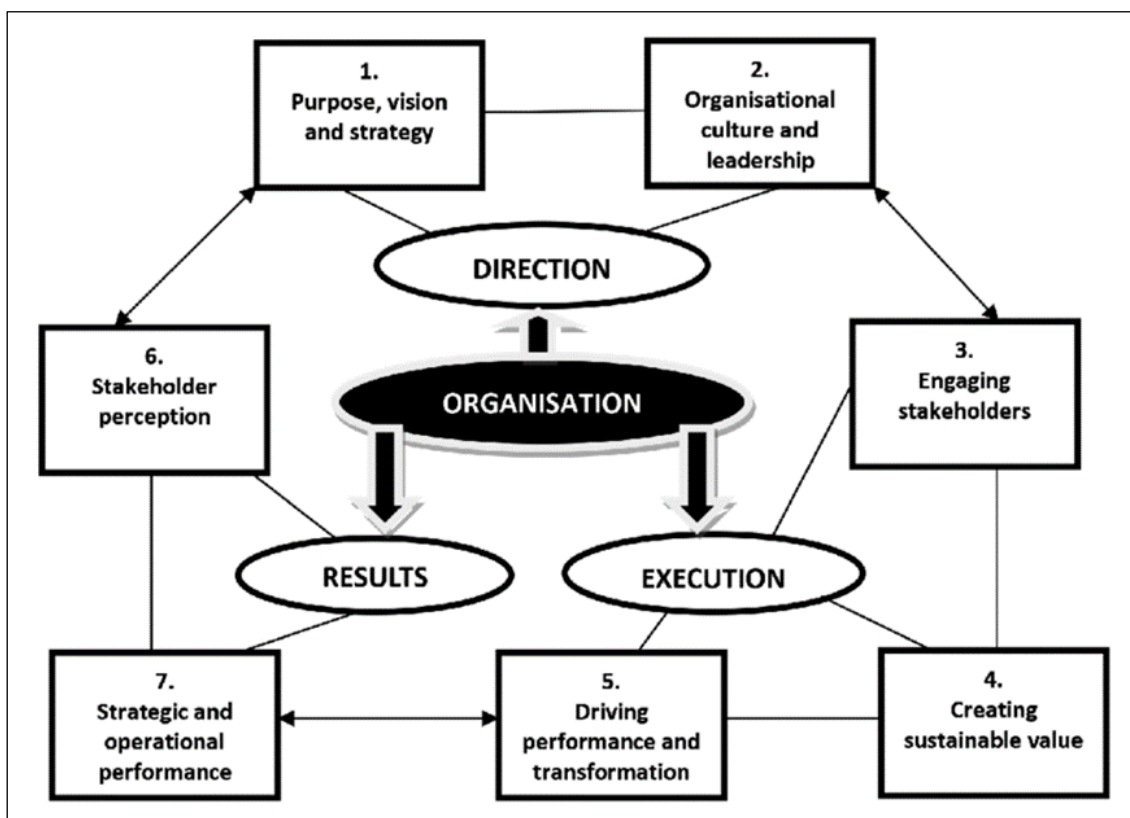


Figure 1 – The structure of the new EFQM model. Source: Adapted according to EFQM (Ghafoor, 2023; EFQM, 2020)

1.5 Existing research on the use of the EFQM model

There is a debate in the professional community about whether the EFQM model should be adapted to specific industries. The EFQM model incorporates generic management terminology that has been successfully applied in organisations of different sizes and types in many countries (Doeleman, 2014). However, although thousands of European organisations have used the model to assess their organisational performance, Davies (2008) and Wongrassamee (2003) have criticised the model, arguing that having the same score in the current EFQM model for all industries is inaccurate. This was echoed by Dubey (2016), who criticised the model and suggested the adoption of new frameworks for specific types of organisations. Liu (2021), in his paper, states that the results of research on restaurant experts show that the criteria for this type of organisation are not all in line with the criteria of the current EFQM model. There will likely be a need to give different sectors different EFQM assessment models in the future. The restaurant industry is given as an example in this study. As such, the new EFQM model developed in this study can be used as a self-assessment tool to assess restaurant performance accurately whenever and wherever. In the Czech Republic, research has been conducted on the awareness of the EFQM model and its

applications and benefits. The research was conducted in about 80 organisations (Nenadál, 2018).

The responses of about 16% of organisations actively working with excellence models showed that the most significant barrier to its successful implementation is the lack of knowledge of the subject. According to most respondent organisations, one of the most significant benefits of excellence models is increased employee engagement and satisfaction. In addition, it also has a positive impact on customer satisfaction. It can also be said that the EFQM model in place positively impacts the economic performance of most of the organisations surveyed (Yousaf, 2022). The next part of the survey was devoted to organisations that are aware of the excellence model but, for some reason, have not implemented it in their practice. According to the survey, 64.16 % of organisations are aware of the excellence models issue. The remaining 35.84 % of organisations operating in the Czech Republic have no idea about the existence of EFQM models. The vast majority of organisations with awareness of excellence models answered that they have no intention of introducing this concept into their practice. The generally shared view was that it is not required by anyone, not even by the management, so organisations have no need to implement any of the excellence models. Time and lack of human resources are the most significant barriers to implementing excellence models. Organisations also lack management confidence that an excellence model will lead to overall performance improvement (Sternad, 2019).

An interesting observation from the survey was that 10.67 % of organisations are concerned about the financial challenges associated with implementing an excellence model. This concern is countered by the fact that in no case did the organisations that already had an excellence model in place identify financial complexity as a significant complication during the implementation of the model. The last part of the survey focused on organisations without awareness of the existence of excellence models. According to almost half of the organisations surveyed, the biggest reason for the lack of awareness of excellence models is the lack of resources and publicity on the subject.

Cartmell (2011) and Rostami (2022) noted a positive relationship between the use of the model in the education sector and improved financial performance such that the model balanced stakeholder expectations and improved processes. Following a similar principle, Hidiroglu (2019) used EFQM to evaluate non-financial aspects of a company. The analyses revealed potential points of prosperity and operational weaknesses needed to make the company more efficient and effective. The use of this model confirmed that the company's performance is excellent, the company is well managed, and its performance is improving. The research showed that the company scored 593 out of 1,000 points, which is higher than the average.

1.6 EFQM and Innovations

Innovation has become a critical driver of success and competitiveness in today's dynamic business environment (Ferreira, 2019). Organisations constantly try to

introduce new and improved products, services, processes and strategies to keep ahead of the competition (Distanont, 2020). Amid this drive for innovation, examining how these organisational innovations impact the functioning of established frameworks of excellence, such as the EFQM model (Kafetzopoulos, 2019), is essential.

The EFQM model supports aligning innovation initiatives with organisational strategies and goals. By incorporating innovation into the strategic planning process, organisations can ensure that innovation efforts are directed towards areas that support the organisation's long-term goals (Gambi, 2020). Strategic alignment ensures that innovation contributes to the overall success and sustainability of the organisation.

The EFQM model recognises the importance of stakeholder engagement, including employees, customers, suppliers and society (Para-González, 2022). Organisations can gain valuable insights, feedback and ideas by involving stakeholders in innovation. The EFQM model encourages organisations to create channels for collaboration, co-creation and open communication to foster an ecosystem that supports innovation across all stakeholder groups (Lehtinen, 2019).

An organisation that effectively manages innovation within the EFQM model can achieve synergies between quantity and quality (Černe, 2023). A continuous improvement and innovation culture drives the generation of more ideas and creates more opportunities to identify high-quality innovations (Rajapathirana, 2018). Feedback, collaboration and learning within the organisation can refine and improve the quality of innovative ideas, leading to the implementation of compelling and valuable innovations (Chiarini, 2020).

In conclusion, the EFQM model influences product and process innovation by providing a structured framework, promoting a customer-centric approach, empowering employees, encouraging collaboration and knowledge sharing, emphasising measurement and evaluation, fostering a culture of continuous improvement, and ensuring strategic alignment. By adopting the principles of the EFQM model, organisations can effectively drive innovation and remain competitive in today's dynamic business environment (Chen, 2021).

1.7 EFQM and Industry 4.0

In the rapidly evolving environment of Industry 4.0, organisations face unprecedented challenges and opportunities brought about by digital transformation (Jayashree, 2021). To prosper in this era of disruptive technologies, organisations must adopt innovative approaches to ensure sustained excellence (Fonseca, 2021). The EFQM (European Foundation for Quality Management) model, a well-established framework for organisational excellence, has recognised the importance of Industry 4.0 and is evolving to align with its principles. (EFQM, 2020). The EFQM model serves as a guide for organisations striving for excellence. Based on a holistic approach, it includes seven criteria grouped into three categories: direction, implementation and results.

Integration with Industry 4.0 is about embracing digital transformation, characterised by the convergence of technologies, including the Internet of Things (IoT), artificial intelligence (AI), robotics and data analytics.

In the era of Industry 4.0, data has become a strategic asset. The EFQM model recognises the importance of digital transformation in increasing an organisation's performance and competitiveness. Furthermore, the EFQM model is consistent with decision-making based on the obtained data. Thanks to integrating Industry 4.0 principles, organisations can use technology to optimise processes, improve decision-making and support innovation (Para-González, 2022).

By using the power of advanced analytics and big data, organisations can gain actionable insights, identify opportunities for improvement and increase operational efficiency. Integrating data-driven decision-making with the EFQM model enables organisations to make informed decisions and promote continuous improvement (Grufman, 2020). Industry 4.0 requires a change in leadership styles that relies on agile and adaptive leadership that can navigate complex and rapidly changing environments (Murthy, 2022). The EFQM model emphasises the role of leadership in driving organisational excellence and provides a framework for agile leadership practices (Nenadál, 2020). By connecting with Industry 4.0, leaders can orient themselves to the complexity of digital transformation, encourage experimentation, and foster a culture of innovation (Fajsi, 2022). This integration enables organisations to respond to market dynamics and promote sustainable growth (Asif, 2020). An unprecedented ability to understand and respond to customer needs is also one of the principles of Industry 4.0. The EFQM model recognises the importance of customer satisfaction and encourages organisations to be customer-centric (Geraedts, 2001). By using digital technologies, organisations can personalise products, services and experiences, increasing customer satisfaction and loyalty. Integrating Industry 4.0 principles with the EFQM model enables organisations to drive business success (Martusewicz, 2021). Industry 4.0 benefits from collaboration and partnerships because organisations recognise the value of collective intelligence and shared resources. The EFQM model emphasises the importance of partnerships and resources in achieving organisational excellence (Vuksanović, 2020). By integrating Industry 4.0 principles, organisations can promote strategic collaboration, engage in open innovation, and co-create value. This integration allows organisations to access new opportunities, share risks and strengthen their competitive advantage in the digital ecosystem (García-Fernández, 2022).

2 HYPOTHESES THAT EMERGED FROM THE PREVIOUS LITERATURE REVIEW

Based on the previous literature review, the following six hypotheses were established:

H1: Organisations with more than 250 employees fulfil the requirements of the EFQM model more than organisations with fewer employees.

H2: Key performance results increase with the degree of fulfilment of the assumptions of the EFQM model.

H3: Employee satisfaction increases with the degree of fulfilment of the assumptions of the EFQM model.

H4: Customer satisfaction increases with the degree of fulfilment of the assumptions of the EFQM model.

H5: Social results increase with the degree of fulfilment of the assumptions of the EFQM model.

H6: Overall results increase with the degree of fulfilment of the assumptions of the EFQM model

3 METHODOLOGY

The presented study aimed to evaluate the connections between the degree of fulfilment of the requirements of the EFQM model and the critical results of the organisation, social responsibility, employee satisfaction and customer satisfaction. The dataset was acquired via an internet-based survey hosted on Google Forms between November 2022 and March 2023. The survey targeted managerial personnel within manufacturing entities situated within the geographical boundaries of the Czech Republic.

A total of 103 responses were obtained, of which 15 were discarded due to failure to meet criteria such as system errors, incomplete data, and irrelevant responses. Thus, 88 participants were included in the resulting research sample. These were 9.09% of micro companies, 20.45% of small companies, 18.18% of medium-sized companies and 52.27% of large companies. A quantitative approach was used in data processing.

Current studies and articles write about different ways to manage organisations and solve various problems. However, not enough has been explored about how effective the EFQM model is for managing organisations.

The main question we wanted to answer is how much the ideas from the EFQM model affect manufacturing organisations of different sizes or how well they contribute to outcomes in defined areas. We looked at existing research and compared different management methods to find answers. Then, we surveyed 88 organisations in the Czech Republic to collect information.

We devised 34 research questions to guide our research and created six hypotheses from those questions. Our main goal was to figure out how important each part of the EFQM model is and how these parts are connected.

4 DATA AND RESULTS

In the following section, we will present the data obtained by the administration of the questionnaire survey, in which all questions were evaluated on a scale from 1 to 5. Descriptive statistics of the collected data sets are presented in (Appendix Table 1).

Hypothesis 1: Differences in Fulfilment of EFQM Model Requirements Based on Organisational Size

The assertion that organisations with more than 250 employees fulfil the requirements of the EFQM model more than organisations with fewer employees was investigated. The Kruskal-Wallis test was employed to examine this hypothesis. The test yielded significant results ($\chi^2 = 11.536$, $df = 3$, $p < 0.01$). Given the observed p-value of 0.009154, which falls below the conventional threshold of 0.05, statistical evidence exists to reject the null hypothesis of median equality.

Consequently, we infer that a statistically significant difference exists among the groups. Subsequently, to find these differences, Tukey's multiple comparison test was conducted, and the corresponding outcomes are outlined in Table 2.

Table 2 – Tukey multiple comparisons of means

Group Comparison	Difference	Lower Bound	Upper Bound	Adj. p-value
Micro - Small	9.43	-6.14	24.99	0.391
Medium - Small	4.93	-7.66	17.52	0.734
Big - Small	13.47	3.28	23.65	<0.01
Medium - Micro	-4.5	-20.36	11.36	0.879
Big - Micro	4.04	-9.99	18.07	0.875
Big - Medium	8.54	-2.09	19.17	0.16

Table 2 indicates a notable statistical distinction between the large and small firms. No statistically significant difference emerged between the large and micro firms. The gathered data does not substantiate the assertion that larger firms exhibit greater EFQM fulfilment. Notably, the absence of a statistically significant fulfilment difference was observed between the large firm and both the micro and medium firms.

Hypothesis 2: Association Between Degree of EFQM Model Assumption Fulfilment and Key Performance Outcomes

The hypothesis posits an increase in key performance outcomes in direct proportion to the extent of adherence to the assumptions outlined by the EFQM model. A non-parametric correlation analysis was conducted to evaluate this hypothesis, utilising the Kendall tau method.

The analysis yielded notable outcomes ($z = 5.7135$, $\tau = 0.4615$, $p < 0.01$). Given the observed p-value < 0.01, which falls below the threshold of 0.05, substantial

evidence exists to reject the null hypothesis denoting the insignificance of the tau coefficient.

Thus, we establish the presence of a statistically significant correlation between the studied factors. The observed tau coefficient exhibits a positive direction, indicating a statistically significant positive correlation. Notably, the tau coefficient is 0.46, suggesting a moderate correlation.

Achieving an increase in crucial performance results is very important for organisations, which should be an inspiration for others. Once again, we prove the validity of the well-known saying that investing in quality pays off.

Hypothesis 3: Relationship Between EFQM Assumption Fulfilment and Employee Satisfaction

Hypothesis 3 postulates an improvement in employee satisfaction in direct proportion to the extent of EFQM assumption fulfilment. A non-parametric correlation analysis was conducted using the Kendall tau method to examine this hypothesis.

The analysis yielded significant findings ($z = 5.99$, $\tau = 0.4746$, $p < 0.01$). With the observed p -value < 0.01 falling below the conventional threshold of 0.05, evidence arises to reject the null hypothesis, denoting the insignificance of the tau coefficient.

Consequently, we establish the presence of a statistically significant correlation between the studied characteristics. The tau coefficient indicates a positive direction, indicating a statistically significant positive correlation. Notably, the value of the tau coefficient stands at 0.47, signifying a moderate correlation.

Thus, employee satisfaction improves with the fulfilment of the requirements of the EFQM model, which can significantly contribute to reducing employee turnover and thereby ensuring more excellent organisational stability.

Hypothesis 4: Connection Between EFQM Assumption Fulfilment and Customer Satisfaction

Hypothesis 4 asserts an improvement in customer satisfaction in alignment with the degree to which the EFQM model's assumptions are fulfilled. A non-parametric correlation analysis employing the Kendall tau method was conducted to evaluate this hypothesis.

This analysis reveals notable findings ($z = 5.249$, $\tau = 0.419$, $p < 0.01$). Given that the obtained p -value < 0.01 is below the conventional significance threshold of 0.05, we possess substantial evidence to reject the null hypothesis, which asserts the insignificance of the tau coefficient.

Consequently, we can confirm the presence of a statistically significant correlation between factors. The tau coefficient indicates a positive direction. The computed tau coefficient assumes a value of 0.42, representing a moderately significant correlation.

A satisfied customer is an essential prerequisite for a successful organisation, which world-renowned Czech entrepreneur Tomáš Baťa emphasised in his slogan “Our customer, our master”. In this case, the EFQM model also makes a demonstrable contribution to improving customer satisfaction.

Hypothesis 5: Relationship Between EFQM Assumption Fulfilment and Social Outcomes

Hypothesis 5 posits a positive relationship in social outcomes with the extent to which the EFQM model's assumptions are met. A non-parametric correlation analysis utilising the Kendall tau method was conducted to investigate this hypothesis.

The analysis results show significant findings ($z = 6.426$, $\tau = 0.509$, $p < 0.01$). Given that the calculated p -value < 0.01 falls below the conventional significance threshold of 0.05, we have evidence to reject the null hypothesis, suggesting the tau coefficient's insignificance.

Consequently, we establish a statistically significant correlation between the variables. The tau coefficient reflects a positive direction, indicating a statistically significant positive correlation. Significantly, the tau coefficient holds a value of 0.51, denoting a moderately significant correlation.

The use of the EFQM model has also shown itself beneficial in this area, i.e., in the area of social behaviour. In the future, the social behaviour of companies will be monitored with much more attention than at present. In the European Union, legislation is being prepared that will make some elements of corporate social behaviour mandatory from 1 January 2024. Therefore, the application of the EFQM model could contribute positively to the implementation of new social indicators.

Hypothesis 6: Association Between EFQM Assumption Fulfilment and Overall Results

Hypothesis 6 suggests a positive association in overall results proportionate to the degree of adherence to the EFQM model's assumptions. A correlation analysis employing the Pearson correlation coefficient method was employed to examine this hypothesis.

The analysis yielded outcomes ($t = 11.351$, $\rho = 0.7744$, $df = 86$, $p < 0.01$). Given the observed p -value of less than 0.05, we have enough evidence to reject the null hypothesis, asserting the insignificance of the correlation coefficient.

Consequently, we establish a statistically significant correlation between the studied variables. The ρ coefficient indicates a positive direction, indicating a statistically significant positive correlation. Notably, the computed ρ coefficient holds a value of 0.7744, indicating a strong and significant correlation.

The application of the EFQM model has demonstrated a positive contribution to the overall results in all monitored areas of organisations, which proves the

usefulness, great importance and perspective of this tool for the future development of organisational management.

5 DISCUSSIONS

The results of the current research offer practical and theoretical implications. Theoretically, the research expands the literature on the EFQM model and its connection with current trends, which are the higher innovative activity of organisations and correlation with Industry 4. Practically, the research results will benefit managers, directors, and leaders of companies by allowing them to maintain an optimal level of quality management and estimate future requirements for complex enterprise integration.

The presented research results have several limitations that must be taken into account. The analysis covers only the years 2022 to 2023. The consequences of COVID-19 were not taken into account in the work.

Many variables affect organisational outcomes; however, we included only a few independent variables based on available data and previous studies.

Further research could be done by including more quality factors and more determinants involved in organisational performance. Researchers and academics should probably include the implications of COVID-19 in their research as part of a comprehensive analysis.

6 CONCLUSION

The results of the statistical analysis of the data show that a statistically significant difference is found only between a large company and a small company. A statistically significant difference between large and micro firms was not found.

A moderately significant correlation with the level of fulfilment of the EFQM model requirements is for the critical performance results, employee satisfaction and customer satisfaction. There is a highly significant correlation with the overall results of the organisation.

The results align with the research of the authors Cartmell, Binsardi and McLean (2011) and the research of Prof. Nenadál (2018). Studies by Seňová and Antošová (2015) and Kanji (2015) also reached similar results. The limits of the research are that they reflect the environment from which we collected our data. Another limitation of the research is the number of completed questionnaires, the disparate environment of different manufacturing companies and the method of obtaining data. Research on the relationship between the degree of fulfilment of the EFQM model requirements and the organisation's size, critical organisational results, social responsibility, employee satisfaction, customer satisfaction and overall organisational results demonstrated a moderately significant to strong correlation for all monitored indicators. This means that the organisation, its employees, its

customers, and other interested parties could benefit from applying the principles of the EFQM model.

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APPENDIX

Table 1 – Descriptive statistics of collected dataset

	n	mean	sd	median	min	max	range	skew	kurtosis
Size of the organisation	88	3.02	1.2	4	1	4	3	-0.75	-1.09
Specify the field of business	88	3.92	1.33	4	1	5	4	-1.12	0.04
Leaders develop mission, vision, values and ethics and act as role models	88	3.08	0.95	3	1	5	4	0.32	-0.03
Leaders define, monitor and review the organisation's management system and its performance and encourage improvement	88	3.22	1	3	1	5	4	-0.43	-0.23
Leaders engage with external stakeholders	88	3.03	0.99	3	1	5	4	0	-0.42
Leaders, together with the organisation's staff, strengthen the culture of excellence	88	2.93	1	3	1	5	4	0	-0.7
Leaders ensure that the organisation is flexible and manages change effectively	88	3.01	0.96	3	1	5	4	-0.1	-0.52
The strategy is based on an understanding of the needs and expectations of both stakeholders and the external environment	88	2.99	0.89	3	1	5	4	0.02	-0.45
The strategy is based on an understanding of internal performance and capability	88	3.11	0.96	3	1	5	4	-0.38	-0.56
Strategies and supporting policies are developed, reviewed and updated	88	3.1	0.91	3	1	5	4	-0.29	-0.35
Strategies and supporting policies are communicated, implemented and monitored	88	2.86	0.97	3	1	5	4	0.2	-0.27

	n	mean	sd	median	min	max	range	skew	kurtosis
Employee plans support the organisation's strategy	88	2.94	1.05	3	1	5	4	-0.35	-0.88
Staff knowledge and competencies are developed	88	3.34	1.1	3	1	5	4	-0.18	-0.8
Workers are identified, engaged and empowered	88	2.99	0.99	3	1	5	4	0.09	-0.7
Employees communicate effectively throughout the organisation	88	2.83	0.97	3	1	5	4	0.19	-1.06
Workers are rewarded, recognised and cared for	88	3.09	1.04	3	1	5	4	-0.06	-0.91
Partners and suppliers are managed with sustainable benefits in mind	88	3.14	0.95	3	1	5	4	-0.19	-0.38
Financial resources are managed to ensure continued success	88	3.16	1.05	3	1	5	4	-0.37	-0.53
Buildings, facilities, materials and natural resources are managed in a sustainable manner	88	3.08	1.02	3	1	5	4	-0.09	-0.66
Technology is managed to support the implementation of the strategy	88	2.88	1.06	3	1	5	4	-0.16	-0.64
Information and knowledge are managed to support effective decision-making and build the capability of the organisation	88	2.9	0.87	3	1	4	3	-0.42	-0.54
Processes are designed and managed to optimise value for stakeholders	88	2.83	0.87	3	1	5	4	-0.08	-0.54
Products and services are developed to create optimal value for stakeholders	88	3.2	1.05	3	1	5	4	-0.29	-0.51
Products and services are effectively promoted and marketed	88	2.94	1.07	3	1	5	4	-0.06	-0.78
Products and services are created, delivered and managed	88	3.08	1.01	3	1	5	4	-0.29	-0.65
Customer relations are managed and improved	88	3.14	0.85	3	1	5	4	-0.03	-0.66
Scales of perception = customers	88	3.09	0.93	3	1	5	4	-0.35	-0.31
Performance indicators = customers	88	3.3	0.75	3	1	5	4	-0.03	0.36
Scales of perception = workers	88	3.07	0.81	3	2	5	3	0.13	-0.96
Performance indicators = workers	88	3	0.91	3	1	5	4	-0.18	-0.61
Scales of perception = society	88	2.99	0.88	3	1	5	4	0.02	0.12
Performance indicators – company	88	3.12	0.87	3	1	5	4	-0.24	-0.21

	n	mean	sd	median	min	max	range	skew	kurtosis
Economic outcomes	88	3.5	0.82	4	1	5	4	-0.88	0.67
Economic performance indicators	88	3.44	0.84	4	1	5	4	-0.74	0.24

REFERENCES

- Asif, M., 2020. Are QM models aligned with Industry 4.0? A perspective on current practices. *Journal of Cleaner Production*, [e-journal] 258. <https://doi.org/10.1016/j.jclepro.2020.120820>.
- Bocoya-Maline, J., Rey-Moreno, M., & Calvo-Mora, A. 2023. The EFQM excellence model, the knowledge management process and the corresponding results: an explanatory and predictive study. *Review of Managerial Science*, 1-35.
- Cartmell, J., Binsardi, B. and McLean, A., 2011. Sector-wide transformational leadership – how effectively is the EFQM Excellence Model® used in the UK FE sector? *Research in Post-Compulsory Education*, [e-journal] 16(2), pp.189-214. <https://doi.org/10.1080/13596748.2011.575291>.
- Černe, M. et al., 2023. Management innovation as an enabler of firm performance in the context of Industry 4.0: a longitudinal multi-source, multi-sector analysis. *Innovation*, [e-journal] pp.1-26. <https://doi.org/10.1080/14479338.2023.2177858>.
- Davies, J., 2008. Integration: is it the key to effective implementation of the EFQM Excellence Model?, [e-journal] 25(4), pp.383-399. <https://doi.org/10.1108/02656710810865267>.
- Distanont, A. and Khongmalai, O. 2020. The role of innovation in creating a competitive advantage. *Kasetsart Journal of Social Sciences*, 41(1), pp.15-21.
- Dodangeh, J. et al., 2011. Designing fuzzy multi criteria decision making model for best selection of areas for Improvement in EFQM (European Foundation for Quality Management) model. *Academic Journals*, 5(12), pp.5010-5021.
- Doeleman, H.J., ten Have, S. and Ahaus, C.T.B., 2013. Empirical evidence on applying the European Foundation for Quality Management Excellence Model, a literature review. *Total Quality Management & Business Excellence*, [e-journal] 25(5-6), pp.439-460. <https://doi.org/10.1080/14783363.2013.862916>.
- Dubey, M., 2016. Developing an Agile Business Excellence Model for Organizational Sustainability. *Global Business and Organizational Excellence*, [e-journal] 35(2), pp.60-71. <https://doi.org/10.1002/joe.21656>.
- The EFQM Model, 2020. *Impact Programme from EFQM*. Available at: <https://efqm.org/the-efqm-model/>.

- Efimova, A. and Briš, P., 2021. Quality 4.0 for Processes and Customers. *Quality Innovation Prosperity*, [e-journal] 25(3), pp.33-47. <https://doi.org/10.12776/qip.v25i3.1609>.
- Fajsi, A. et al., 2022. Project Management Maturity and Business Excellence in the Context of Industry 4.0. *Processes*, [e-journal] 10(6). <https://doi.org/10.3390/pr10061155>.
- Ferreira, J.J.M., Fernandes, C.I. and Ferreira, F.A.F., 2019. To be or not to be digital, that is the question: Firm innovation and performance. *Journal of Business Research*, [e-journal] 101, pp.583-590. <https://doi.org/10.1016/j.jbusres.2018.11.013>.
- Fonseca, L., 2022. The EFQM 2020 model. A theoretical and critical review. *Total Quality Management & Business Excellence*, [e-journal] 33(9-10), pp.1011-1038. <https://doi.org/10.1080/14783363.2021.1915121>.
- Fonseca, L., Amaral, A. and Oliveira, J., 2021. Quality 4.0: The EFQM 2020 Model and Industry 4.0 Relationships and Implications. *Sustainability*, [e-journal] 13(6). <https://doi.org/10.3390/su13063107>.
- Gunasekaran, A., Subramanian, N. and Ngai, W.T.E., 2019. Quality management in the 21st century enterprises: Research pathway towards Industry 4.0. *International Journal of Production Economics*, [e-journal] 207, pp.125-129. <https://doi.org/10.1016/j.ijpe.2018.09.005>.
- Kafetzopoulos, D. and Gotzamani, K., 2019. Investigating the role of EFQM enablers in innovation performance. *The TQM Journal*, [e-journal] 31(2), pp.239-256. <https://doi.org/10.1108/TQM-09-2018-0124>.
- Kanji, K.G., 2015. *Measuring Business Excellence*. New York: Routledge.
- Kiitam, A. and Tammaru, T., 2012. Impact of application of excellence models on organisational performance. In: *Tallinn University of Technology, 8th International DAAAM Baltic Conference*, 19-21 April 2012. Tallinn: Tallinn University of Technology.
- Gambi, L.D.N. et al., 2020. The impact of quality management practices on innovation: an empirical research study of Brazilian manufacturing companies. *Benchmarking: An International Journal*, [e-journal] 28(3), pp.1059-1082. <https://doi.org/10.1108/BIJ-04-2020-0168>.
- García-Fernández, M., Claver-Cortés, E. and Tarí, J.J., 2022. Relationships between quality management, innovation and performance. *European Research on Management and Business Economics*, [e-journal] 28(1). <https://doi.org/10.1016/j.iedeen.2021.100172>.
- Geraedts, H.P.A., Montenarie, R. and van Rijk, P.P., 2001. The benefits of total quality management. *Computerised Medical Imaging and Graphics*, [e-journal] 25(2), pp.217-220. [https://doi.org/10.1016/S0895-6111\(00\)00052-5](https://doi.org/10.1016/S0895-6111(00)00052-5).

Ghafoor, S., Mann, R. and Grigg, N., 2023. An investigation of the global awareness of business excellence and best practices in promoting the use of business excellence. *Total Quality Management & Business Excellence*, [e-journal] 34(13-14), pp.1857-1881.

<https://doi.org/10.1080/14783363.2023.2210061>.

Grufman, N., Lyons, S. and Sneider, E., 2020. Exploring Readiness of SMEs for Industry 4.0. *Complex Systems Informatics and Modeling Quarterly*, [e-journal] (25), pp.54-86. <https://doi.org/10.7250/csimq.2020-25.04>.

Hidroğlu, D., 2019. Self-assessment Performance Measurement in Construction Companies: An Application of the EFQM Excellence Model on Processes and Customer Stages. *Procedia Computer Science*, [e-journal] 158, pp.844-851. <https://doi.org/10.1016/j.procs.2019.09.122>.

Chen, Q., Wang, C.-H. and Huang, S.-Z., 2021. Effects of organisational innovation and technological innovation capabilities on firm performance: evidence from firms in China's Pearl River Delta. In *Inside the Changing Business of China Organizational Evolution, Culture, Leadership and Innovation*. pp. 72-96.

Chiarini, A., 2020. Industry 4.0, quality management and TQM world. A systematic literature review and a proposed agenda for further research. *The TQM Journal*, [e-journal] 32(4), pp.603-616. <https://doi.org/10.1108/TQM-04-2020-0082>.

Jayashree, S., Reza, M.N.H. and Malarvizhi, C.A.N., 2021. Industry 4.0 implementation and Triple Bottom Line sustainability: An empirical study on small and medium manufacturing firms. *Heliyon*, [e-journal] 7(8). <https://doi.org/10.1016/j.heliyon.2021.e07753>.

Lehtinen, J., Peltokorpi, A. and Artto, K., 2019. Megaprojects as organisational platforms and technology platforms for value creation. *International Journal of Project Management*, [e-journal] 37(1), pp.43-58. <https://doi.org/10.1016/j.ijproman.2018.10.001>.

Liu, Y. L., Pen-Fa, K., Chiang, J. T. and Shyr, W. J., 2021. Should the EFQM Excellence Model be Adapted for Specific Industries? A Restaurant Sector Example. *International Journal of Hospitality Management*, [e-journal] 92. <https://doi.org/10.1016/j.ijhm.2020.102694>.

Martusewicz, J., Szewczyk, K. and Wierzbic, A., 2021. 7 EFQM RADAR-Based Assessment of RFID System as Part of Industry 4.0 Implementation – A Case Study of a Production Plant. *Industry 4.0: A Glocal Perspective*, 24.

Mirhosseini, Z. and Mohebhoori, S., 2012. Evaluation of the performance of the national library and archives of the Islamic Republic of Iran, based on the EFQM organisational excellence model. *Journal of Management Future Studies*, 1, pp. 63–84.

- Murthy, M.N., Sangwan, K.S. and Narahari, N.S., 2022. Tracing evolution of EFQM and its relationship with Industry 4.0. *Total Quality Management & Business Excellence*, [e-journal] 33(15-16), pp.1737-1776. <https://doi.org/10.1080/14783363.2021.1999802>.
- Nenadál, J., Vykydal, D. and Waloszek, D., 2018. Organisational Excellence: Approaches, Models and Their Use at Czech Organizations. *Quality Innovation Prosperity*, [e-journal] 22(2), pp.47-64. <https://doi.org/10.12776/qip.v22i2.1129>.
- Nenadál, J., 2020. The New EFQM Model: What is Really New and Could Be Considered as a Suitable Tool with Respect to Quality 4.0 Concept? *Quality Innovation Prosperity*, [e-journal] 24(1), pp.17-28. <https://doi.org/10.12776/qip.v24i1.1415>.
- Para-González, L., Jiménez-Jiménez, D. and Martínez-Lorente, Á.-R., 2022. Does EFQM enhance learning and innovation? *Total Quality Management & Business Excellence*, [e-journal] 33(7-8), pp.727-751. <https://doi.org/10.1080/14783363.2021.1890016>.
- Rajapathirana, R.P.J. and Hui, Y., 2018. Relationship between innovation capability, innovation type, and firm performance. *Journal of Innovation & Knowledge*, [e-journal] 3(1), pp.44-55. <https://doi.org/10.1016/j.jik.2017.06.002>.
- Rostami Alileh, T., Rastgoo, A., Namvar, Y. and Sattari, S., 2022. Validating of Applied Model for the Implementation of the School Management Excellence Program. *Iranian journal of educational sociology*, 5(4), pp.170-184.
- Sanders, J. O., 2017. *Spiritual leadership: Principles of excellence for every believer*. Moody Publishers.
- Seňová, A. and Antošová, M., 2015. Business performance assessment and the EFQM Excellence Model 2010 (case study). *Management: journal of contemporary management*, 20(1), pp.183-190.
- Sternad, D., Krenn, M. and Schmid, S. (2019). Business excellence for SMEs: motives, obstacles, and size-related adaptations. *Total Quality Management & Business Excellence*, 30(1-2), pp. 151-168.
- Vuksanović Herceg, I. et al., 2020. Challenges and Driving Forces for Industry 4.0 Implementation. *Sustainability*, [e-journal] 12(10), p.4208. <https://doi.org/10.3390/su12104208>.
- Westerveld, E., 2003. The Project Excellence Model®: Linking success criteria and critical success factors. *International Journal of Project Management*, 21(6), pp.411-418.
- Yousaf, M. and Bris, P., 2019. A Systematic Literature Review of the EFQM Excellence Model from 1991 to 2019. *International Journal of Applied Research in Management and Economics*, [e-journal] 2(2), pp.11-15. <https://doi.org/10.33422/ijarme.v2i2.211>.

Yousaf, M., 2022. Intellectual capital and firm performance: evidence from certified firms from the EFQM excellence model. *Total Quality Management & Business Excellence*, [e-journal] 33(13-14), pp.1472-1488. <https://doi.org/10.1080/14783363.2021.1972800>.

Wongrassamee, S., Simmons, J.E.L. and Gardiner, P.D., 2003. Performance measurement tools: the Balanced Scorecard and the EFQM Excellence Model. *Measuring Business Excellence*, [e-journal] 7(1), pp.14-29. <https://doi.org/10.1108/13683040310466690>.

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CONFLICTS OF INTEREST

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