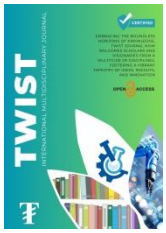
DOI 10.5281/twist.10049652#398

TWIST, 2025, Vol. 20, Issue 2, pp. 1-8

TWIST

Journal homepage: www.twistjournal.net



The Mediating Role of Innovation in the Relationship Between TQM, Information Technology, and Operational Performance:

The Case of SMEs in Makassar City, Indonesia

Wahyudi*
Faculty of Islamic Economics and Business/Management, Universitas Islam Negeri Alauddin Makassar,
Jln Sultan Alauddin 63, Gowa, 92113, Indonesia
[**Corresponding author*]

Nurmiati
Faculty of Islamic Economics and Business/Management, Universitas Islam Negeri Alauddin Makassar,
Jln Sultan Alauddin 63, Gowa, 92113, Indonesia

Suriyanti
Faculty of Islamic Economics and Business/Management, Universitas Muslim Indonesia,
Jl. G. Nona Baru No. 47, Makassar, 90234, Indonesia

Abstract
The purpose of this paper is to the mediating role of innovation in the relationship between TQM, information technology, and operational performance: the case of SMEs in Makassar city, Indonesia. This paper used a quantitative research design. A total of 195 questionnaires were distributed to and collected from owners/managers of SMEs in Makassar, Indonesia to acquire requisite data for examining the hypothesized model of the study. Partial least squares structural equation modeling was used to analyze the research data. The results of the empirical study show that there is a positive and significant statistical impact of total quality management and information technology on operational performance. There was also a positive, direct and statistically significant effect of the information technology on total quality management. Meanwhile, Innovation plays a mediating role between TQM and operational performance.

Keywords
TQM, IT, Innovation, Operational Performance

INTRODUCTION

Development in the era of globalization is highly dependent on the economic sector as a measure of success carried out by the government. The role of society in national development, especially in economic development, is Micro, Small and Medium Enterprises (MSMEs). The position of MSMEs in the national economy has an important and strategic role. This condition is very possible because the existence of MSMEs is quite dominant in the Indonesian economy (Sarfiah, Atmaja, and Verawati 2019). MSMEs after the economic crisis continue to increase from year to year. This proves that MSMEs are able to survive in the midst of the economic crisis. MSMEs have also been proven to absorb a larger workforce in the national economy. The large number of workers absorbed can increase people's income, thus MSMEs are considered to have a strategic role in reducing unemployment and poverty. In terms of contribution and role, it is important for the government to continue to support through strengthening so that the role of MSMEs as a pillar in building the nation's economy can run optimally (Sarfiah et al. 2019).

The increasingly competitive level of business competition and the need for efficiency and effectiveness in the management of the company itself requires every company to be ready and able to adopt the use of information technology. In this case, MSMEs must be encouraged to immediately be able to utilize technological developments to support the company's competitiveness Consoli, (2012) stated that many companies have used and utilized technology in

an effort to improve performance, including MSMEs. The implementation of innovation leads to organizational changes, product, process, or marketing improvements that lead to significant progress that helps companies improve their performance and profits. In other words, the implementation of an effective management system will encourage innovation in the company and indirectly affect the company's performance (Trieu et al. 2023).

Innovation activities have long been considered an important factor influencing corporate performance (Tapanainen et al. 2022; Dao et al., 2016). Innovation plays a critical role in predicting the long-term survival of an organization, determining the success of an organization, and maintaining its global competitiveness, especially in an environment where technology, competitive position, and customer demands can change almost overnight, and where product and service life cycles are becoming shorter (Yusr et al., 2016).

In Indonesia, most MSMEs still run their businesses in traditional ways. It is unfortunate that the use of information technology among MSMEs is still very limited. There are several reasons for the lack of applications in this field. The main reason is that some MSMEs are still hesitant because they do not really understand the technology. Various studies show that the perception and behavior of using information technology is more influenced by the ignorance of small business actors regarding its functions and benefits (Basry and Sari 2018).

The lack of small business actors in utilizing information technology is also influenced by several factors, such as the low understanding of MSME actors regarding the benefits of information technology in developing their businesses, the low availability of information technology investment, the still low support from government institutions, and the relative lack of individual ability of MSME actors in using information technology (Lubis and Junaidi 2016). However, if these shortcomings can be overcome, then there is still an opportunity for the use of information technology by small business actors. This is where the role of socialization and training in the use of information technology for small business actors is very much needed in Indonesia (Basry and Sari 2018).

The occurrence of competition in the business world is inevitable, considering the large number of business actors as is currently happening. In Indonesia, the number of MSMEs has increased significantly, as seen from data from the Ministry of Cooperatives and SMEs, the number of MSMEs in Indonesia in 2021 was 64.19 million with participation in gross domestic product (GDP) of 61.97% or worth IDR 8.6 trillion. Data from the Ministry of Cooperatives and SMEs recorded that as of February 2022, there were already 17.26 million MSME actors who had entered the digital ecosystem and the growth rate reached 100% faster than the previous year. From the statement above, it can be clearly seen in

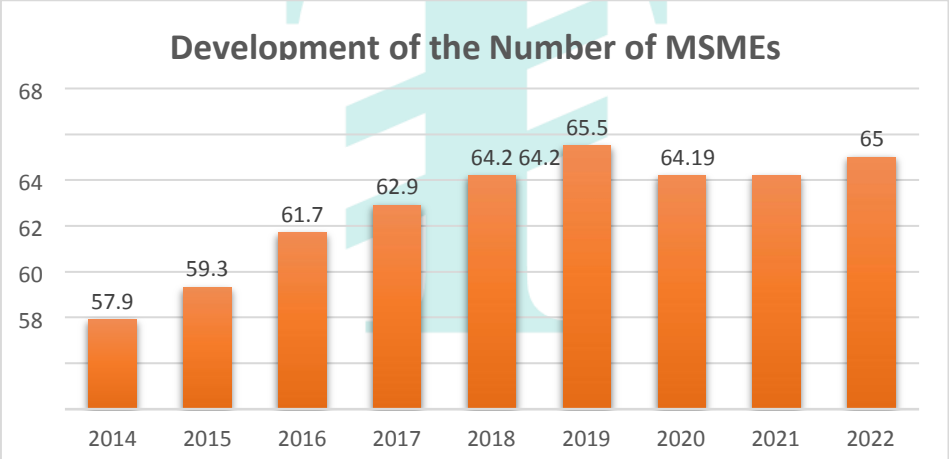


Fig. 1 Development of Number of MSMEs
Source: Department of Cooperatives and Small-Medium Enterprises

Based on the data above, the increase in the number of MSME business sectors from 2014 to 2022 has increased significantly. In 2020, the number of MSMEs decreased due to the Covid-19 pandemic which resulted in a lack of income that resulted in business closures. This significant increase in the number of MSMEs cannot be separated from the role of technology that enables business actors to survive and continue to create new innovations to improve their business performance. In Makassar City, which is the capital city of South Sulawesi Province, MSMEs engaged in various industries have consistently recorded quite high growth in recent years. Based on data from the Cooperatives and MSMEs Service in South Sulawesi Province, the number of MSME business units in South Sulawesi increased quite significantly throughout from 2019 to 2021. In 2019, there were more than 940 thousand business units, then to around 1.2 million in 2020, and increased again to 1.5 million business units in 2021 (https://sindikatpost.com accessed on February 20, 2022). However, behind this significant growth of MSMEs, there are certainly several obstacles or problems that occur. One of the problems is that MSMEs in Makassar City still do not use information technology enough to run their businesses. Makassar City DPRD Chairman Rudianto Lallo assessed that it is time for business actors to be able to utilize information technology to manage their businesses. The reason is, currently there are still many MSMEs that are not aware of the benefits of technology (https://m.bisnis.com accessed February 20, 2024). In an effort to increase the productivity and efficiency of MSMEs, it is necessary to utilize the development of Information Technology effectively because it can have a direct impact on MSMEs. The positive impact on MSMEs is that they can enjoy various benefits from the use of information technology, where MSMEs can communicate quickly, increase productivity, build new business opportunities, and connect to global networks with international reach (Basry and Sari 2018).

In the words of Rockert (1979), information technology has become an integral part of the company (Hassan 2022; Alnoor et al. 2021). It is also recognized that information technology provides a critical foundation that modern businesses can use to address volatile market threats by leveraging their digital processes, knowledge, and physical capital (Gu, Yang, & Huo, 2021; Bustinza, Vendrell-Herrero, Perez-Arostegui, & Parry, 2019). Information technology capability is defined as the ability to mobilize and deploy information technology-based resources in combination with other resources and capabilities that facilitate organizational resilience by creating digital procedures and knowledge repositories (Chakravarty, Grewal, & Sambamurthy, 2013). Dalenogare, et al. (2018) investigated the impact of several new technologies commonly associated with Industry 4.0. They found that the following technology groups have a positive relationship with operational performance: computer-aided design with computer-aided manufacturing, digital automation with sensors, and big data.

TQM is one of the main management approaches to improve company performance in terms of customer satisfaction, operational performance, financial results, and quality performance. (Aquilani et al., 2017). TQM has been adopted by several manufacturing organizations around the world because of its ability to facilitate better performance that can be justified through operational excellence. (Chauke et al., 2019; Modgil and Sharma, 2016; Vasantharayalu and Pal, 2016). Every company will always evaluate its business performance within a certain period of time. Company performance is a result of management activities in the company. The results of these management actions are then used as parameters or benchmarks to assess the success of company management in achieving the goals that have been set because success can be assessed through the performance of the company.

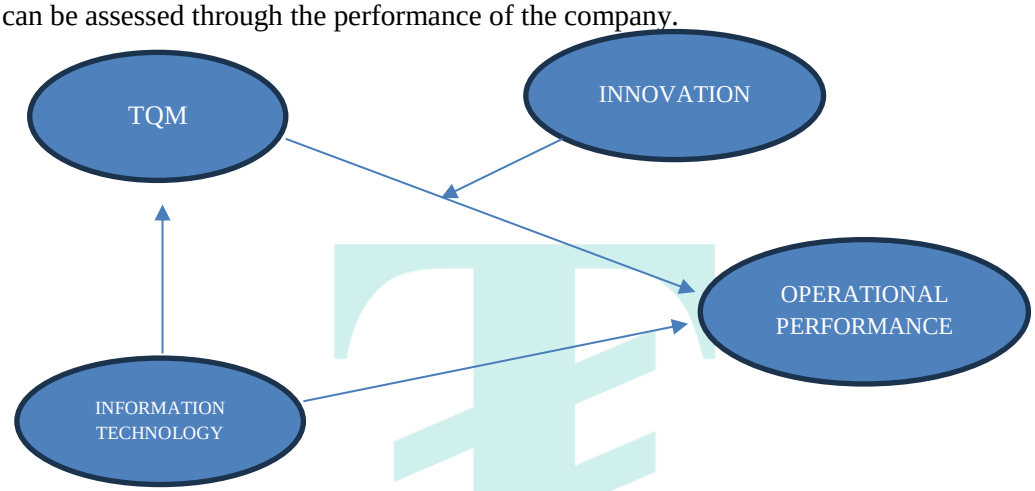


Fig. 2 Conceptual framework

MATERIALS AND METHODS

Total Quality Management

TQM is the application of quantitative methods and human resources to improve all processes within an organization and exceed current and future customer needs (Yu, Park, and Hong 2020). Bagi Marchiori & Mendes, (2020), TQM is a holistic management approach, increasingly applied to the continuous improvement of organizational processes and focuses on meeting client needs, long-term perspective, employee involvement, teamwork, process redesign, and supplier relationships. Thus, TQM ensures that managers adopt quality strategies, focus on prevention, and have the essential machinery to improve performance (Toke and Kalpande 2020).

Information Technology

Information technology currently plays a very important role in supporting performance so that company performance can run more effectively and efficiently. Changes in the business environment have caused companies to increasingly rely on information technology to achieve and maintain competitiveness, increase productivity, and thrive in the contemporary dynamic market (Yunis et al., 2018; Apulu, Latham, & Moreton, 2011). Information technology has become an inseparable part of the company (Alnoor et al. 2021). DSPST technology provides benefits for companies in gaining market share and new ideas to develop their business. In the success phase, technology has become an accelerator for business development through social networking, automation of recording, and online marketing (Rahman, Yaacob, and Radzi, 2016). At this stage, SMEs need to prioritize their ability to assess technology needs related to optimal efficiency and productivity (Rahman et al. 2016). Therefore, the application of information technology in organizations has caused changes in various dimensions of the organization, including organizational structure, so an appropriate organizational structure is needed to be able to work in utilizing information technology efficiently. (Al-abrrow et al. 2019; Peyman 2011). Information technology in many organizations supports the sustainability and growth of their business. (Dahlberg, Hokkanen, and Newman, 2017).

Innovation

Innovation is seen as an important driver for companies operating in dynamic markets (Wu, Lii, and Wang 2015). The activities involved in innovation are both internal and external, because the search for new ideas and opportunities, and

the generation of new knowledge applied to opportunities require interaction between the firm and its environment (Genc, Dayan, 2019). The most innovative companies will gain more profits than their competitors (Archibugi, 2017; Lyon and Ferrier, 2002). Innovation capability is defined as an organization's potential to create value through the generation, adoption, or exploitation of new ideas, technologies, and business models (Jiang et al., 2020),

Operation Performance

Corporate performance is also often interpreted as the company's performance and its ability to meet shareholder expectations (Tapanainen et al. 2022). Performance is the result of the resulting management and operations systems, which provide information about how well internal and external resources are being used. Performance measurement often emphasizes a process-oriented approach that focuses on assessing the effectiveness and efficiency of a business using a set of metrics (Henri, 2004) and can be used to improve business operations (Martinez-Caro., 2020; Karimi and Walter 2015). Operational performance is also the company's internal operational performance in terms of improving product quality, developing new products, and increasing productivity (Ibrahim, 2016). Operational performance means making manufacturing plants competitive to produce and deliver products with increased capabilities to target markets (Zhu et al., 2008).

Methodology

A survey instrument was developed to investigate the three linkages between TQM practices, information technology, innovation, and operational performance of MSMEs in Makassar, Indonesia. The questionnaire was designed based on a scale established from the literature. Data to test the research hypotheses were collected through a survey of MSMEs in the retail sector in Makassar City, Indonesia in 2024. All questionnaire items used a five-point Likert scale (Lu, 2012). SMART-PLS 3.0 software package was applied for the statistical examination of the questionnaire (Hair et al. 2019), The Ensour and Alizizi (2014) scale was used to measure information technology and includes 12 items. The innovation construct is also a multidimensional scale with three components: promotion of innovation contemplation, production of innovation contemplation, and implementation of innovative behavior. Promotion of innovation contemplation was evaluated using three items, production of innovation contemplation involved three items, and implementation of innovative behavior was measured by three items adapted from (Zhu et al., 2015) Company performance is measured by two components: operational performance and market performance. The operational performance construct is measured by three items based on (Zhu et al., 2015), and market performance was measured by five items adapted from (Zhu et al., 2015; Zhang et al 2009). Five TQM practices are measured using the MBNQA performance excellence criteria (Haffar et al., 2017; Valmohammadi and Roshanzamir, 2015). The TQM construct in this study was measured as a whole structure and evaluated through 10 items adapted from research conducted by Wang et al (2012). The researchers applied a random sampling procedure to select a sample of 195 companies.

RESULTS

The population of this study is SMEs in Makassar, Indonesia, taken from the available list of 195 MSMEs across different industries. It took six months to conduct the survey, from January 2024 to June 2024.

Table 1 Profiles of sample respondents (N-195)

	Sample	Percentage (%)
Business Field		
Services	135	69
Manufacturing	34	17
Logistics and distribution	26	14
Years of Operations		
Less than 2	48	24
4-Feb	82	42
7-May	41	21
10-Aug	20	11
More than 11 years	4	2
Qualification		
Undergraduate	147	76
Postgraduate	28	14
Others	20	10

Research Instrument Test Results

This model is assessed through item loading, convergent validity, measurement reliability, and discriminant validity. At values higher than 0.7, the items are considered reliable. Convergent validity is through average variance extraction (AVE), which must pass the standard minimum level of 0.5 (Harrigan et al. 2017; Fornell and Larcker, 1981). Measurement reliability was examined by Cronbach's alpha. Cronbach's alpha coefficient has shown poor item-to-total correlations (Shin and Biocca, 2017). Discriminative validity was measured by the square root of the mean-variance and the correlation of latent variables. Internal consistency was measured through Cronbach's alpha. The lower limit of 0.7 was accepted according to the established scale (Zhou et al., 2014). Discriminative validity was estimated. Convergent

constructs require AVE more than 0.5, and the correlation of one construct with another construct is smaller than the square root of the AVE construct (Zhang et al., 2019). Tables II, and III show that the results are acceptable because the values meet the standard level. This study uses the Fornell and Larcker (1981) criterion evaluation measurement model: Cronbach's alpha must be significant and higher than 0.7; CR more than 0.7; and AVE must be more than 0.5.

Table 2 The convergent validity and reliability of the model

Variables	AVE	Composite reliability	Cronbach's alpha
Total Quality Management	0.549	0.819	0.723
Information Technology	0.576	0.912	0.825
Innovation	0.563	0.892	0.785
Operational Performance	0.618	0.921	0.869

Table 3 The discriminant validity of the measurement model

Structures	OP	TQM	IT	INO
OP	0.874			
TQM	0.571	0.723		
IT	0.452	0.427	0.754	
INO	0.441	0.387	0.465	0.732

Structural model

The structural model examination also evaluated the path coefficients, which clarify the strengths of the relationship between the independent and dependent variables. This paper used a bootstrap resampling approach to find the t-statistics and standard errors. The bootstrap technique utilizes a confidence evaluation method that differs from that of a normal calculation. Table VI illustrates the analysis of path coefficients, standard error, t value, and the results, which clarify that H1, H2 and H3, H4 were supported. The current research results have interesting outcomes for discussion that expand previous studies focusing on the concept of performance.

Table 4 Path coefficients.

Hypotheses	Coefficient	T-statistic	P-Values	Result
Total Quality Management →Operational Performance	0.423	7.214	0.000	Supported
Information Technology → Operational Performance	0.341	2.591	0.000	Supported
Information Technology →Total Quality Management	0.298	4.685	0.000	Supported

Table 5 Indirect effects

Indirect effects	Coef.	T-statistic	P-Values	Result
TQM→Innovation→ Operational Performance	0.051	8.346	0.039	Supported

DISCUSSION

The impact of Total Quality Management on Operational Performance

Based on the results of the study, it shows that total quality management has a positive and significant effect on the operational performance of MSMEs in Makassar, Indonesia. This indicates that optimizing the implementation of TQM dimensions can produce effective operational performance in MSMEs in the city of Makassar, Indonesia. The results of this study are in line with (Wahyudi et al., 2022; Kebede Adem and Virdi 2021; Ali, Hilman, and Gorondutse, 2020; Tortorella et al. 2020; Sharma and Modgil, 2020; Kiprotich, et al., 2018; Vasantharayalu and Pal 2016; Youssef et al., 2016).

The implementation of TQM dimensions in SMEs in Makassar city provides an opportunity to compete because business operations run smoothly so that SMEs performance is getting better. Therefore, SMEs in Makassar tends to grow along with the optimal implementation and dimensions of TQM. According to Herzallah, et al., (2014) The importance of implementing TQM when implemented properly, has the potential to enable SMEs to reduce waste, costs, and errors; improve internal communication, problem-solving skills, understanding of customer needs and satisfaction and consequently provide high-quality products at low costs. In total quality management, employees are accounted for their operational performance and are given reinforcement to find ways to improve it (Green et al., 2019).

In addition, SMEs in Makassar City involves all members in its business as an effort to continuously improve quality, and each employee has a role in achieving operational performance. The implementation of integrated quality management excels in building an environment that empowers employees to identify and solve problems (Chang and Sun, 2007), while keeping them involved and committed to quality assurance (Jiménez-Jiménez and Martínez-Costa, 2009; Iyer et al., 2013). In total quality management, employees are accounted for their operational performance and given reinforcement to find ways to improve it (Green et al., 2019).

The impact of Information technology on Operational Performance

The results of the study show that information technology has a positive and significant effect on the operational performance of MSMEs in Makassar City, Indonesia. This indicates that the use of efficient information technology can improve operational performance. This study is in line with Camilleri et al., 2024; Trieu et al. 2023; Chege, Wang, and Suntu, 2020; Liu, Chen, and Gao, 2020; Oh, Teo, and Sambamurthy, 2012.

MSMEs in Makassar City have used information technology in running their businesses so that their operational activities run efficiently and effectively. MSMEs' awareness in operating technology makes their businesses more flexible and makes it easier for consumers, which greatly affects the operational performance of MSME businesses in Makassar City. The successful implementation of information technology is a significant determining element in improving company performance (Zhou et al. 2014). Likewise, according to Rivard, Raymond, and Verreault, (2006) Information technology is considered a valuable organizational resource that can enhance organizational capabilities and ultimately result in higher performance.

The impact of Information technology on Total Quality Management

Based on the results of the study, it shows that information technology has a positive and significant influence on total quality management. This explains that the use of information technology is able to optimize the dimensions of total quality management in MSMEs in Makassar City, Indonesia. This is in line with (Lobo et al., 2019; Zioupou et al. 2019; Seok et al., 2018; Alhazmi et al., 2017; Torre, 2016; Bolatan et al. 2016; Khanam, Siddiqui, and Talib, 2013) bahwa penerapan teknologi informasi yang tepat dapat mempengaruhi hubungan total quality management.

MSME business actors in Makassar City who have used information technology are able to increase productivity and improve services. In addition, existing information technology is able to facilitate communication and the implementation of quality tools, systems, and practices. Therefore, information technology provides appropriate resources for the successful implementation of TQM programs through various applications such as design, development, implementation, communication, support, or management of computer-based information systems. This is similar to what has been stated by Bolatan et al., 2016; Khan et al., 2015.

The role of innovation as a mediator in the relationship between TQM and operational performance

Based on the results of the study, it shows that innovation has a mediating influence in the relationship between TQM and operational performance of MSMEs in Makassar City. This indicates that TQM and Innovation partially affect operational performance in MSMEs in Makassar City. The results of this study are in line with previous studies by Tetteh et al., (2024) and Khalfallah et al., (2022).

In implementing TQM practices, of course, there needs to be strong support from the actors of MSMEs in Makassar City so that in business management they can achieve maximum results. Therefore, it can be expected that the implementation of appropriate quality practices can encourage the development of innovative actions (Kafetzopoulos et al., 2015). Furthermore, employees are calculated for their operational performance and given reinforcement to find ways to improve it (Green et al., 2019). Thus, it can be expected that the implementation of appropriate quality practices can encourage the development of innovative actions (Kafetzopoulos et al., 2015).

CONCLUSION

This study provides investigative evidence on the relationship between TQM practices and information technology on operational performance with innovation as a mediator. The structural model supports the direct and indirect effects of TQM, and information technology on OP, IT on TQM, and TQM on OP mediated by innovation. This study adds to the knowledge of operations management literature in several ways. First, this study provides a framework that synergizes TQM practices with IT to provide maximum impact on operational performance and the mediation linkage of innovation in the relationship between TQM and OP. Therefore, it is recommended that TQM practices should be combined with IT. Second, this study contributes to the TQM, and IT literature by providing experimental evidence on their roles in achieving operational performance. Third, Innovation has a strong positive effect on mediating TQM practices. In turn, impacts operational performance.

REFERENCES

1. Al-abrrow, Hadi, Alhamzah Alnoor, Eman Ismail, Bilal Eneizan, and Hebah Zaki. 2019. “Cogent Business & Management Psychological Contract and Organizational Misbehavior : Exploring the Moderating and Mediating Effects of Organizational Health and Psychological Contract Breach in Iraqi Oil Tanks Company Psychological Contract and Organizati.” doi: 10.1080/23311975.2019.1683123.
2. Ali, Gamal Abdualmajed, Haim Hilman, and Abdullahi Hassan Gorondutse. 2020. “Effect of Entrepreneurial Orientation, Market Orientation and Total Quality Management on Performance: Evidence from Saudi SMEs.” *Benchmarking* 27(4):1503–31. doi: 10.1108/BIJ-08-2019-0391.
3. Alnoor, Alhamzah, Hasan Oudah Abdullah, Hadi Al-abrrow, Khai Wah Khaw, Intisar Abas Al-awidi, Sammar Abbas, and Amina Omrane. 2021. “A Fuzzy Delphi Analytic Job Demands-Resources Model to Rank Factors Influencing Open Innovation.” *Transnational Corporations Review* 0(0):1–15. doi: 10.1080/19186444.2021.1956854.
4. Archibugi, Daniele. 2017. “Blade Runner Economics: Will Innovation Lead the Economic Recovery?” *Research Policy* 46(3):535–43. doi: 10.1016/j.respol.2016.01.021.
5. Atkinson, Maurice. 2012. “Developing and Using a Performance Management Framework: A Case Study.” *Measuring Business Excellence* 16(3):47–56. doi: 10.1108/13683041211257402.

6. Basry, Asril, and Essy Malays Sari. 2018. "Penggunaan Teknologi Informasi Dan Komunikasi (TIK) Pada Usaha Mikro, Kecil Dan Menengah (UMKM)." *IKRA-ITH Informatika : Jurnal Komputer Dan Informatika* 2(3):53–60.
7. Bolatan, Gulin Idil Sonmezturk, Sitki Gozlu, Lutfihak Alpkan, and Selim Zaim. 2016. "The Impact of Technology Transfer Performance on Total Quality Management and Quality Performance." *Procedia - Social and Behavioral Sciences* 235(October):746–55. doi: 10.1016/j.sbspro.2016.11.076.
8. Camilleri, Mark Anthony. 2024. "Factors Affecting Performance Expectancy and Intentions to Use ChatGPT: Using SmartPLS to Advance an Information Technology Acceptance Framework." *Technological Forecasting and Social Change* 201(January):123247. doi: 10.1016/j.techfore.2024.123247.
9. Chege, Samwel Macharia, Daoping Wang, and Shaldon Leparan Suntu. 2020. "Impact of Information Technology Innovation on Firm Performance in Kenya." *Information Technology for Development* 26(2):316–45. doi: 10.1080/02681102.2019.1573717.
10. Consoli, Domenico. 2012. "Literature Analysis on Determinant Factors and the Impact of ICT in SMEs." *Procedia - Social and Behavioral Sciences* 62(Figure 1):93–97. doi: 10.1016/j.sbspro.2012.09.016.
11. Dahlberg, Tomi, Päivi Hokkanen, and Mike Newman. 2017. "A Longitudinal Study on the Perceived Roles of IT and the Corporate IT Function with Influences on CIOs' Work Equilibria in a Media Company." *Proceedings of the Annual Hawaii International Conference on System Sciences* 2017-Janua:5164–73. doi: 10.24251/hicss.2017.627.
12. Genc, Ebru, Mumin Dayan, and Omer Faruk Genc. 2019. "The Impact of SME Internationalization on Innovation: The Mediating Role of Market and Entrepreneurial Orientation." *Industrial Marketing Management* 82(December 2018):253–64. doi: 10.1016/j.indmarman.2019.01.008.
13. Hair, Joseph F., Jeffrey J. Risher, Marko Sarstedt, and Christian M. Ringle. 2019. "When to Use and How to Report the Results of PLS-SEM." *European Business Review* 31(1):2–24. doi: 10.1108/EBR-11-2018-0203.
14. Harrigan, Paul, Uwana Evers, Morgan Miles, and Timothy Daly. 2017. "Customer Engagement with Tourism Social Media Brands." *Tourism Management* 59:597–609. doi: 10.1016/j.tourman.2016.09.015.
15. Hassan, Azizul. 2022. *Technology Application in Tourism in Asia: Innovations, Theories and Practices*.
16. Herzallah, Ahmad M., Leopoldo Gutiérrez-Gutiérrez, and Juan Francisco Munoz Rosas. 2014. "Total Quality Management Practices, Competitive Strategies and Financial Performance: The Case of the Palestinian Industrial SMEs." *Total Quality Management and Business Excellence* 25(5–6):635–49. doi: 10.1080/14783363.2013.824714.
17. Jiménez-Jiménez, Daniel, and Micaela Martínez-Costa. 2009. "The Performance Effect of HRM and TQM: A Study in Spanish Organizations." *International Journal of Operations and Production Management* 29(12):1266–89. doi: 10.1108/01443570911005992.
18. Karimi, Jahangir, and Zhiping Walter. 2015. "The Role of Dynamic Capabilities in Responding to Digital Disruption: A Factor-Based Study of the Newspaper Industry." *Journal of Management Information Systems* 32(1):39–81. doi: 10.1080/07421222.2015.1029380.
19. Kebede Adem, Mulugeta, and Sandeep Singh Virdi. 2021. "The Effect of TQM Practices on Operational Performance: An Empirical Analysis of ISO 9001: 2008 Certified Manufacturing Organizations in Ethiopia." *TQM Journal* 33(2):407–40. doi: 10.1108/TQM-03-2019-0076.
20. Khanam, Suby, Jamshed Siddiqui, and Faisal Talib. 2013. "Role of Information Technology in Total Quality Management." *International Journal of Advanced Research in Computer Engineering &Technology* 2(8):2433–45.
21. Kiprotich, Evans, Hazel Gachunga, and Ronald Bonuke. 2018. "Influence of Cost Leadership Procurement Strategy on Performance of Manufacturing Firm in Kenya." *European Journal of Business and Strategic Management* 3(1):32–51.
22. Lubis, Tona Aurora, and Junaidi Junaidi. 2016. "Pemanfaatan Teknologi Informasi Pada Usaha Mikro Kecil Dan Menengah Di Kota Jambi." *Jurnal Perspektif Pembiayaan Dan Pembangunan Daerah* 3(3):163–74. doi: 10.22437/ppd.v3i3.3535.
23. Marchiori, Danilo, and Luís Mendes. 2020. "Knowledge Management and Total Quality Management: Foundations, Intellectual Structures, Insights Regarding Evolution of the Literature." *Total Quality Management and Business Excellence* 31(9–10):1135–69. doi: 10.1080/14783363.2018.1468247.
24. Mohamed A. Youssef, Eyad M. Youssef, and Article. 2016. "The Synergistic Impact of ISO9000 and TQM on Operational Performance and Competitiveness." *International Journal of Quality & Reliability Management*.
25. Oh, Lih Bin, Hock Hai Teo, and Vallabh Sambamurthy. 2012. "The Effects of Retail Channel Integration through the Use of Information Technologies on Firm Performance." *Journal of Operations Management* 30(5):368–81. doi: 10.1016/j.jom.2012.03.001.
26. Peyman, Yarmohammadzadeh. 2011. "The Analysis of the Relationship between Organizational Structure and Information Technology (IT): And the Barriers to Its Establishment at the University of Isfahan from the Faculty Member ' s Viewpoints." 1(1):98–104. doi: 10.5539/hes.v1n1p98.
27. Rahman, Nurulhasanah Abdul, Zulnaidi Yaacob, and Rafisah Mat Radzi. 2016. "An Overview of Technological Innovation on SME Survival: A Conceptual Paper." *Procedia - Social and Behavioral Sciences* 224(August 2015):508–15. doi: 10.1016/j.sbspro.2016.05.427.

28. Rivard, Suzanne, Louis Raymond, and David Verreault. 2006. "Resource-Based View and Competitive Strategy: An Integrated Model of the Contribution of Information Technology to Firm Performance." *Journal of Strategic Information Systems* 15(1):29–50. doi: 10.1016/j.jsis.2005.06.003.
29. Sarfiah, Sudati, Hanung Atmaja, and Dian Verawati. 2019. "UMKM Sebagai Pilar Membangun Ekonomi Bangsa." *Jurnal REP (Riset Ekonomi Pembangunan)* 4(2):1–189. doi: 10.31002/rep.v4i2.1952.
30. Sharma, Sanjay, and Sachin Modgil. 2020. "TQM, SCM and Operational Performance: An Empirical Study of Indian Pharmaceutical Industry." *Business Process Management Journal* 26(1):331–70. doi: 10.1108/BPMJ-01-2018-0005.
31. Shin, Dong Hee, and Frank Biocca. 2017. "Health Experience Model of Personal Informatics: The Case of a Quantified Self." *Computers in Human Behavior* 69:62–74. doi: 10.1016/j.chb.2016.12.019.
32. Tapanainen, Tommi, Kien Trung Dao, Hai Nguyen Thi Thanh, Hue The Nguyen, Ngoc Bich Dang, and Nguyen Danh Nguyen. 2022. "Impact of Dynamic Capabilities and Firm Characteristics on the Firm Performance of Vietnamese Small and Medium-Sized Retail Enterprises." *International Journal of Management and Enterprise Development* 21(1):28–61. doi: 10.1504/IJMED.2022.120539.
33. Toke, Lalit K., and Shyamkumar D. Kalpande. 2020. "Total Quality Management in Small and Medium Enterprises: An Overview in Indian Context." *Quality Management Journal* 27(3):159–75. doi: 10.1080/10686967.2020.1767008.
34. Tortorella, Guilherme, Ricardo Giglio, Flavio S. Fogliatto, and Rapinder Sawhney. 2020. "Mediating Role of Learning Organization on the Relationship between Total Quality Management and Operational Performance in Brazilian Manufacturers." *Journal of Manufacturing Technology Management* 31(3):524–41. doi: 10.1108/JMTM-05-2019-0200.
35. Trieu, Hoa D. X., Phuong Van Nguyen, Thuong T. M. Nguyen, Hai T. M. Vu, and Khoa T. Tran. 2023. "Information Technology Capabilities and Organizational Ambidexterity Facilitating Organizational Resilience and Firm Performance of SMEs." *Asia Pacific Management Review* 28(4):544–55. doi: 10.1016/j.apmrv.2023.03.004.
36. Vasantharayalu, and Surajit Pal. 2016. "An Empirical Study of Total Quality Management (Tqm) Practices on Operational Performance of Indian." *International Journal of Management* 7(6):192–202.
37. Wahyudi. 2022. "Peran TQM, Budaya Organisasi, Dan Kepuasan Karyawan Dalam Meningkatkan Kinerja Perusahaan: Studi Pada Hotel Claro Makassar." *Jurnal Ilmiah Akuntansi Peradaban* VIII(1):121–35.
38. Wu, Li Wei, Yuan shuh Lii, and Chung Yu Wang. 2015. "Managing Innovation through Co-Production in Interfirm Partnering." *Journal of Business Research* 68(11):2248–53. doi: 10.1016/j.jbusres.2015.06.006.
39. Yu, Gun Jea, Minjae Park, and Ki Hoon Hong. 2020. "A Strategy Perspective on Total Quality Management." *Total Quality Management and Business Excellence* 31(1–2):68–81. doi: 10.1080/14783363.2017.1412256.
40. Yunis. 2018. "The Role of ICT and Innovation in Enhancing Organizational Performance: The Catalyzing Effect of Corporate Entrepreneurship." *Journal of Business Research* 88(1):344–56.
41. Yusr, Maha Mohammed. 2016. "Innovation Capability and Its Role in Enhancing the Relationship between TQM Practices and Innovation Performance." *Journal of Open Innovation: Technology, Market, and Complexity* 2(1):1–15. doi: 10.1186/s40852-016-0031-2.
42. Zhou, Kevin Zheng, Julie Juan Li, Shibin Sheng, and Alan T. Shao. 2014. "The Evolving Role of Managerial Ties and Firm Capabilities in an Emerging Economy: Evidence from China." *Journal of the Academy of Marketing Science* 42(6):581–95. doi: 10.1007/s11747-014-0371-z.
43. Zhu, Lu and. 2015. *High-Performance Human Resource Management and Firm Performance The Mediating Role of Innovation in China*.
44. Zioupou, Sofia, Basil Manos, Zacharoula Andreopoulou, and Irini Tzimitra-Kalogianni. 2019. "Exploring Information Technology and Total Quality Management Implementation by Food and Drink Manufacturing Enterprises." *International Journal of Agricultural and Environmental Information Systems* 10(3):1–13. doi: 10.4018/IJAEIS.2019070101.