

The role of digital leadership to improve innovation capabilities and TQM of MSMEs in Indonesia

Stefanus Rumangkit

BINUS Entrepreneurship Center
Bina Nusantara University
Jakarta, Indonesia 11480
stefanus.rumangkit@binus.ac.id

Antonius Satria Hadi

Entrepreneurship Study Program
Widya Mataram University
Yogyakarta, Indonesia 55132
antonius_satria@widyamataram.ac.id

Abstract

This study explores and examines the relationship between digital leadership, innovation capabilities, and total quality management (TQM) in the context of MSMEs in Indonesia. In addition, this study examines the shaping factors of digital leadership, namely visionary leadership, digital-based learning culture, systematic improvement, and professionalism. The conceptual framework proposed in this study refers to the resources advantage theory of competition. This study is quantitative research with a data collection method using a questionnaire. The sample in this study is MSMEs who are members of the creative community in Lampung, Indonesia. The number of samples in this study was 100 respondents. The sampling technique used purposive random sampling. Respondents in this study are MSMEs because they have knowledge and insight into business management. Data analysis techniques and hypotheses testing use structural equation modeling with the help of SmartPLS 3 software. The results of this study showed that visionary leadership, digital-based learning culture, systematic improvement, and professionalism are the antecedents of digital leadership. Meanwhile, innovation capabilities affect total quality management. All hypotheses in this study were accepted.

Keywords

Digital Leadership, Innovative Capabilities, Total Quality Management, MSMEs

1. Introduction

Total quality management (TQM) is the main focus for organizations that provide goods or services. The TQM concept puts forward the quality of products or services to meet consumers' expectations (Zhang et al., 2021). The TQM concept has been implemented in several countries, namely: Japan, America, India, Saudi Arabia, China, and also Indonesia (Antunes et al., 2021; Attri et al., 2021; Fok et al., 2021; Sahputra et al., 2021; Xin et al., 2021). Previous research explained that TQM is associated with several factors, such as organizational culture, knowledge management, workplace health, and job performance (Barua, 2021; Khurniawan et al., 2021; Lagrosen and Lagrosen, 2022; Temiz et al., 2021; Yazdani, 2021). However, research linking TQM and digital leadership is still very rarely investigated. Most previous research has focused on visionary leadership (Soliman, 2018; Wasono and Furinto, 2018), and has scarcely looked at the relationship between digital leadership and TQM. Therefore, this study will try to explore the relationship between TQM and digital leadership.

Digital leadership is a new science in human resource management. Digital leadership puts forward the figure of a leader who utilizes digital data to achieve the organization's strategic goals. Digital leadership is believed to focus on customer satisfaction through continuous improvement (Purwanto, 2022; Zhong, 2017). Therefore, digital leadership will encourage the implementation of TQM by increasing effective and efficient ways of working for quality

improvement. The role of digital leadership is expected so that individuals within the organization will carry out digital-based control to maintain the quality of products and services.

This study will try to investigate the influence of digital leadership on TQM. Previous research indicates that there are several factors forming digital leadership, namely: visionary leadership, digital-based learning culture, systematic improvement, and professionalism. These factors will try to be associated with TQM. In addition, researchers also add innovation capabilities based on the perspective of analysis from the resource advantage theory of competition. Innovation capabilities can grow new strategies in maintaining or improving the quality of products or services (Hunt & Morgan, 1996).

2. Literature Review

Digital leadership is the art of directing, influencing others, and initiating sustainable change through access to information, and building relationships to anticipate changes that are important for future success (Jackson and Dunn-Jensen, 2021). For that, it takes a dynamic combination of mindsets, behaviors, and skills to change or improve organizational culture through the help of technology (Proksch et al., 2021). This digital leadership framework is designed based on a combination of technology, motivation, and leadership style (Antonopoulou et al., 2021). Digital leadership is one of the most appropriate, fast, cross-hierarchical, work-group-oriented, and collaborative approaches, focusing mainly on innovation (Avidov et al., 2022).

The proposed conceptual model is shown in Figure 1. This study will try to examine the role of digital leadership, innovation capabilities, and TQM. The model was developed based on the resource advantage theory of competition, which emphasizes that competition will drive innovation and organizational learning so that organizations have a competitive advantage (Amaya et al., 2022). The theory views that comparative advantage in organizational resources will allow the organization to compete with other organizations. One strategy to have a competitive advantage is through TQM (Benzaquen and Charles, 2022). Organizations will have products or services that have superior quality when TQM is applied on an ongoing basis. Digital leadership will encourage the implementation of digital-based TQM so that this application can provide customers satisfaction. In addition, innovation capabilities can be an essential factor in TQM. This is because, with the ability to innovate, leaders can find new ideas that can support quality management (García-Fernández et al., 2022).

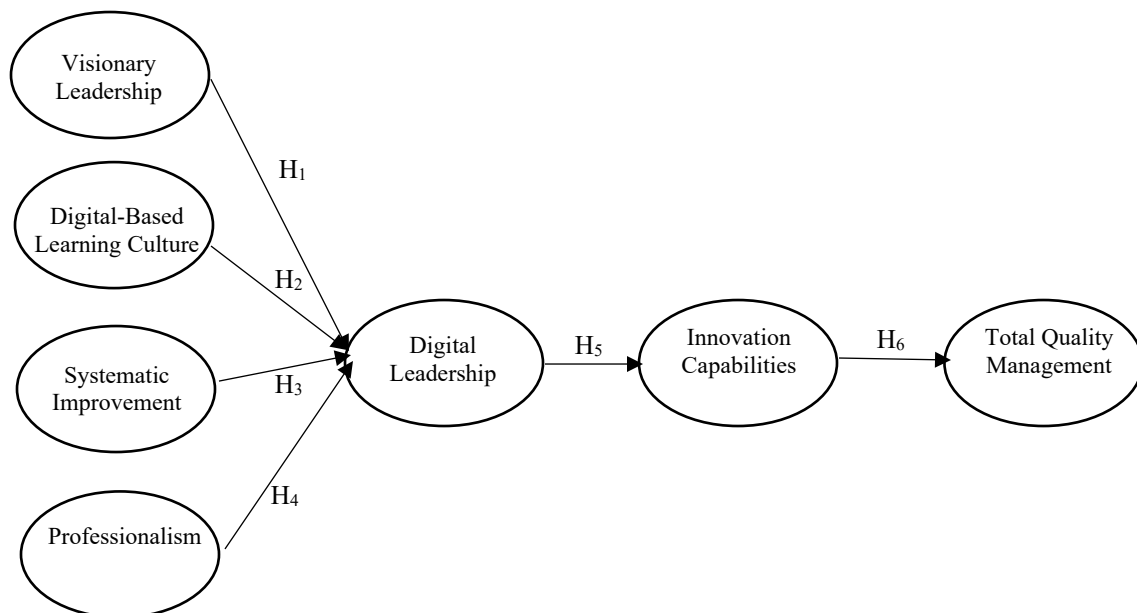


Figure 1. Research Model

Based on the explanation above, the hypotheses developed are:

- H1 : Visionary leadership has a positive effect on digital leadership
- H2 : Digital-based learning culture has a positive effect on digital leadership
- H3 : Systematic improvement has a positive effect on digital leadership
- H4 : Professionalism has a positive effect on digital leadership
- H5 : Digital Leadership has a positive effect on innovative capabilities
- H6 : Innovation Capabilities has a positive effect on Total Quality Management

3. Methods

The object of this research is MSMEs who are members of the Lampung creative cottage community. This study uses a quantitative approach, using primary data. The data collection method uses a questionnaire with an online survey approach. The type of data used is cross-sectional data. The research sample amounted to 100 respondents. The sampling technique is purposive sampling. Respondents involved in this research are business owners because they have knowledge and insight into business management. Measurement of digital leadership, innovation capabilities, and TQM refers to measuring tools developed by previous research, namely: 1) visionary leadership and digital-based learning culture refer to measuring tools developed by Kehr et al. (2022) and Sayaf et al (2021) with 5 question items, 2) professionalism refers to the measuring tool developed by Tedla et al. (2022) with 3 question items, 3) systematic improvement refers to the measuring tool developed by Hovlid et al. (2022) with 2 question items, 4) digital leadership refers to a measuring tool developed by Zhong (2017) with 3 question items, 5) innovation capabilities refers to a measuring tool developed by Shivdas et al. (2021) with 3 question items, 6) TQM refers to a measuring tool developed by Soliman (2018) with 5 question items. Hypothesis testing will use Smart PLS.

4. Results and Discussion

A total of 100 questionnaires were distributed. The questionnaires were given and filled out by the MSME owners. The results of the distribution of the questionnaire can be seen in the following Table 1:

Table 1. Results of Questionnaire Distribution

	Number of Questionnaire
Distributed questionnaire	100
Questionnaire not returned	0
Returning questionnaire	100
Questionnaire that cannot be processed	0
Processable questionnaire	100

Based on Table 1, it can be concluded that 100 respondents who filled out the questionnaire can be used as data to be processed. The questionnaire was processed using Smart PLS 3. The validity, reliability, and hypothesis tests were carried out in data analysis. Prior to data processing, descriptive statistical analysis was carried out to see the demographic characteristics of the respondents, which included gender, age, education level, length of business, business turnover, and type of business. From the descriptive statistical analysis results, it can be concluded that most of the respondents who filled out the questionnaire were female (57%), with an age range of 31-35 years old (25%). In terms of education, most of them have a bachelor's degree education (40%) and have been running a business for a span of 4-6 years (38%). For gross business profit, it ranges from 1 to 5 million (42%), and most of the respondents have a business in the trade sector (25%). (Table 2)

Table 2. Demographic Characteristics of Respondents

Demographic		Frequency	Percentage
Gender	Male	43	43%
	Female	57	57%
Age	25 – 30 years old	12	12%
	31 – 35 years old	25	25%
	36 – 40 years old	15	15%
	41 – 45 years old	19	19%
	46 – 50 years old	17	17%
	above 50	12	12%
Education	Senior high school	21	21%
	Diploma	27	27%
	Bachelor's degree	40	40%
	Master's degree	12	12%
Business Age	1 – 3 years	23	23%
	4 – 6 years	38	38%
	6 – 9 years	27	27%
	above 10 years	12	12%
Gross Profit	1 – 5 million	42	42%
	5 – 10 million	32	32%
	10 – 15 million	18	18%
	above 15 million	8	8%
Type of business	Culinary	25	25%
	Fashion	18	18%
	Creative Products	24	24%
	Automotive	8	8%
	Trading	25	25%

After conducting descriptive statistical analysis, then the validity and reliability tests were carried out. Table 3 shows the results for testing the validity and reliability. The validity and reliability test shows that all question items have met the requirements of validity and reliability because the value of Cronbach's Alpha and composite reliability ≥ 0.07 , while the standardized factor loading value ≥ 0.5 (Hair et al., 2018). After testing the validity and reliability, the hypothesis was then tested. And Figure 1 shows the results of hypothesis testing.

Table 3. Validity and Reliability Test

Observed Variable	Result of Validity Test	Result of Reliability Test	
	Standardized factor loading $\geq 0,5$	Cronbach's Alpha $\geq 0,7$	Composite Reliability (CR) $\geq 0,7$
Visionary Leadership			
VL1	0,712	0,715	0,779
VL2	0,762		
Digital-Based Learning Culture			
DBC1	0,628	0,756	0,879
DBC2	0,723		
DBC3	0,834		
Professionalism			
PF1	0,757	0,752	0,716
PF2	0,724		
PF3	0,677		
Systematic Improvement			
SI1	0,816	0,836	0,917
SI2	0,716		
Digital Leadership			
DL1	0,754	0,734	0,797
DL2	0,813		
DL3	0,768		
Innovative Capabilities			
IC1	0,709	0,713	0,745
IC2	0,733		
IC3	0,694		
Total Quality Management			
TQM1	0,836	0,771	0,788
TQM2	0,756		
TQM3	0,812		
TQM4	0,751		
TQM5	0,609		

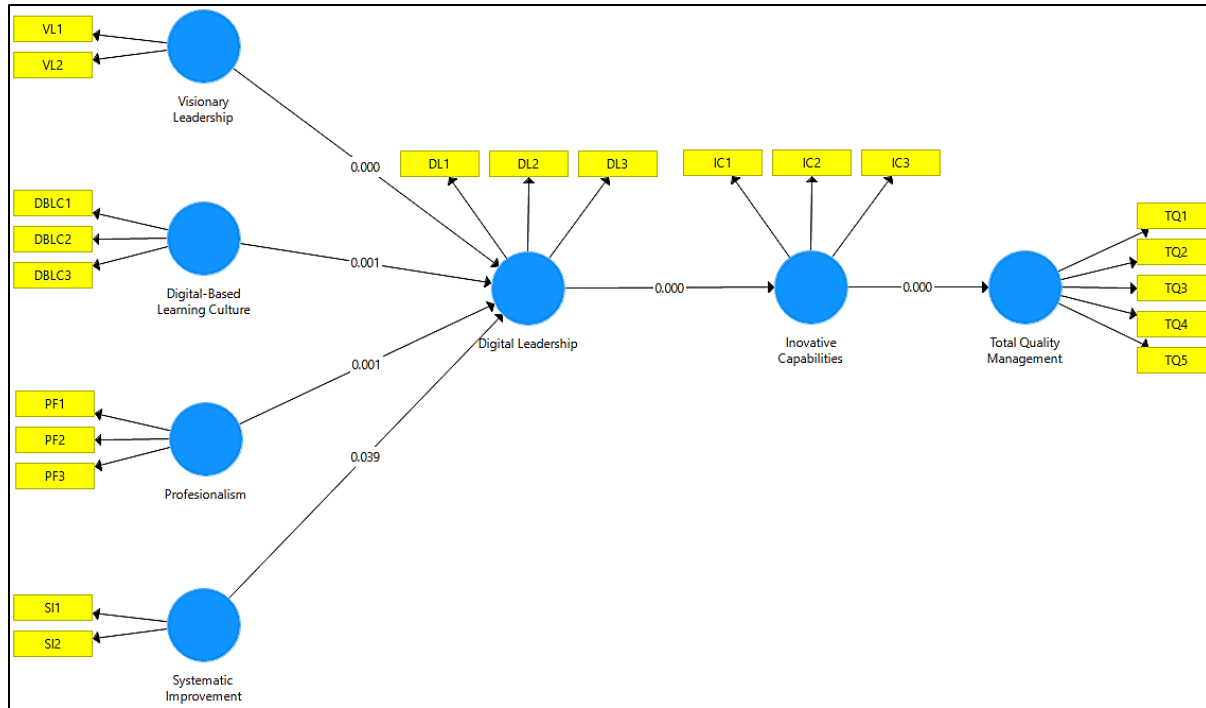


Figure 1. Statistical hypotheses testing

The following Table 4 is the conclusion of hypothesis testing:

Table 4. Summary of Hypotheses Testing

Hypothesized	P Value	Conclusion
H ₁ : Visionary Leadership → Digital Leadership	0.000	Supported
H ₂ : Digital Based Learning Culture → Digital Leadership	0.001	Supported
H ₃ : Professionalism → Digital Leadership	0.001	Supported
H ₄ : Systematic Improvement → Digital Leadership	0.048	Supported
H ₅ : Digital Leadership → Innovative Capabilities	0.000	Supported
H ₆ : Innovative Capabilities → Total Quality Management	0.000	Supported

This study discusses a new topic in the science of human resources management and operations management. This is because very few studies explore digital leadership and TQM. The conceptual model in this study proposes several tests, namely: 1) the forming factors of digital leadership, which include: visionary leadership, digital-based learning culture, systematic improvement, and professionalism (H₁, H₂, H₃, and H₄), 2) digital leadership influences innovation capabilities (H₅), and 3) innovation capabilities affect the total quality management (H₆).

The first finding in this study was that visionary leadership, digital-based learning culture, systematic improvement, and professionalism have an effect on digital leadership. (Figure 1). A visionary leader means a leader who can predict future conditions and is able to adapt to changes. Visionary leadership is characterized by the use of technology to achieve the organization's vision and the courage to issue policies, programs, and funding for technology procurement. From these two characteristics, it can be interpreted that a visionary leader will support the use of technology, which will encourage the leader to have a tendency to become a leader with a digital leadership style (Zhen et al., 2021). In addition, digital leadership is also demonstrated by an attitude of professionalism, willingness to learn, and encouraging continuous improvement. Leaders who tend to have a digital leadership style will tend to dare to carry out digital transformations, continually update the latest technology, have the ability to innovate, and will encourage

all elements of the organization to understand and be sensitive to technological advances (Araujo et al., 2021; Mihardjo et al., 2019).

The second finding in this study was that digital leadership has an effect on innovation capabilities. Digital leadership refers to leaders who encourage all elements of the organization to use technology to get work done (Araujo et al., 2021). This shows that one of the characteristics possessed by digital leadership is innovation capabilities. Leaders will continuously innovate on work systems and technology to achieve effective and efficient work results. In addition, digital leadership always prioritizes innovation that makes organizations have competitive dynamics so that organizations will always experience changes for the better (Benitez et al., 2022). This is in line with the resource advantage theory of competition, which states that competition will encourage organizations to change and innovate so that new ideas emerge that can be used as competitive advantages (Wang and Gao, 2021).

The third finding in this study was that innovation capabilities have an effect on TQM. Innovation capabilities refer to leaders who have the ability to innovate. Leaders with high innovation capabilities will encourage quality improvement and TQM (García-Fernández et al., 2022). Leaders are proven to contribute to the successful implementation of TQM significantly. Innovation capabilities possessed by leaders will encourage leaders to think about sustainable quality management systems (Lizarelli et al., 2021). For example, with technological developments in the form of artificial intelligence (AI), leaders with innovation capabilities will make changes by using AI to run the quality system to minimize errors (Zhen et al., 2021). In addition, when a leader has a digital leadership style, the leader will allocate company resources to use technology to support TQM implementation (AlNuaimi et al., 2022).

5. Conclusion

This study examined the forming factors of digital leadership, namely: visionary leadership, digital-based learning culture, systematic improvement, and professionalism. In addition, this study investigated the effect of digital leadership on innovative capabilities and examine the effect of innovative capabilities on total quality management. The results of this study indicated that visionary leadership, digital-based learning culture, systematic improvement, and professionalism affect digital leadership. Another finding from this study was that digital leadership affects innovative capabilities, and finally, TQM is influenced by innovative capabilities.

References

- AlNuaimi, B. K., Kumar Singh, S., Ren, S., Budhwar, P., and Vorobyev, D., Mastering digital transformation: The nexus between leadership, agility, and digital strategy. *Journal of Business Research*, vol. 145, pp. 636–648, 2022
- Amaya, N., Bernal-Torres, C. A., Nicolás-Rojas, Y. W., and Pando-Ezcurra, T. T., Role of internal resources on the competitive advantage building in a knowledge-intensive organisation in an emerging market. *VINE Journal of Information and Knowledge Management Systems, ahead-of-print*(ahead-of-print), 2022.
- Antonopoulou, H., Halkiopoulos, C., Barlou, O., and Beligiannis, G. N., Associations between Traditional and Digital Leadership in Academic Environment: During the COVID-19 Pandemic. *Emerging Science Journal*, vol. 5, no.4, pp. 405–428, 2021.
- Antunes, M. G., Mucharreira, P. R., Justino, M. R. T., and Texeira-Quirós, J., Effects of Total Quality Management (TQM) Dimensions on Innovation—Evidence from SMEs. *Sustainability*, vol.13, no,18, pp. 2–18, 2021.
- Araujo, L. M. de, Priadana, S., Paramarta, V., and Sunarsi, D., Digital leadership in business organizations. *International Journal of Educational Administration, Management, and Leadership*, vol.2, no.1, pp. 45–56, 2021
- Attri, R., Khan, N. Z., Siddiquee, A. N., and Khan, Z. A., Analysing the barriers to successful implementation of total quality management in Indian manufacturing organisations using best-worst method. *International Journal of Business Excellence*, vol. 24, no. 2, pp. 275–294, 2021.
- Avidov-Ungar, O., Shamir-Inbal, T., and Blau, I., Typology of digital leadership roles tasked with integrating new technologies into teaching: Insights from metaphor analysis. *Journal of Research on Technology in Education*, vol. 54, no. 1, pp. 92–107, 2022.
- Barua, B., Impact of total quality management factors on knowledge creation in the organizations of Bangladesh. *The TQM Journal*, vol. 33, no. 6, pp. 1516–1543, 2021.
- Benitez, J., Arenas, A., Castillo, A., and Esteves, J. (2022). Impact of digital leadership capability on innovation performance: The role of platform digitization capability. *Information & Management*, vol. 59, no. 2, pp. 103590, 2022.

- Benzaquen, J., and Charles, V., A stratified bootstrapping approach to assessing the success of TQM implementation in Peruvian companies. *Total Quality Management & Business Excellence*, vol. 33, no. 1–2, pp. 178–201, 2022.
- Fok, L. Y., Morgan, Y.-C., and Zee, S. M. L., A Multi-Industry Study of Sustainability, Total Quality Management, Organizational Culture, and Performance. *International Journal of Operations and Quantitative Management*, vol. 27, no. 1, pp. 45–10, 2021.
- García-Fernández, M., Claver-Cortés, E., and Tarí, J. J., Relationships between quality management, innovation and performance: A literature systematic review. *European Research on Management and Business Economics*, vol. 28, no. 1, 2022.
- Hovlid, E., Husabø, G., Teig, I. L., Halvorsen, K., and Frich, J. C. (2022). Contextual factors of external inspections and mechanisms for improvement in healthcare organizations: A realist evaluation. *Social Science & Medicine*, vol. 298, 2022.
- Hunt, S. D., and Morgan, R. M., The Resource-Advantage Theory of Competition: Dynamics, Path Dependencies, and Evolutionary Dimensions. *Journal of Marketing*, vol. 60, no. 4, pp. 107–114, 1996.
- Jackson, N. C., and Dunn-Jensen, L. M., Leadership succession planning for today's digital transformation economy: Key factors to build for competency and innovation. *Business Horizons*, vol. 64, no. 2, pp. 273–284, 2021.
- Kehr, H. M., Voigt, J., and Rawolle, M., Implicit motives as the missing link between visionary leadership, approach and avoidance motivation, and vision pursuit. *Organizational Psychology Review*, vol. 12, no. (2), pp. 135–161, 2022.
- Khurniawan, A. W., Sailah, I., Muljono, P., Indriyanto, B., & Maarif, M. S. (2021). *The Collaborative Strategy of Total Quality Management and School Governance to Improving Effectiveness of Vocational School-Based Enterprise | Journal of Educational and Social Research*. vol. 2, no. 2, pp. 10–21.
- Lagrosen, S., and Lagrosen, Y., Workplace stress and health – the connection to quality management. *Total Quality Management & Business Excellence*, vol. 33, no. 1–2, pp. 113–126, 2022.
- Lizarelli, F. L., de Toledo, J. C., and Alliprandini, D. H., Relationship between continuous improvement and innovation performance: An empirical study in Brazilian manufacturing companies. *Total Quality Management & Business Excellence*, vol. 32, no. 9–10, pp. 981–1004, 2021.
- Mihardjo, L. W. W., Sasmoko, Alamsjah, F., and Elidjen, Digital leadership impacts on developing dynamic capability and strategic alliance based on market orientation. *Polish Journal of Management Studies*, vol. 19, no. 2, pp. 285.297, 2019.
- Proksch, D., Rosin, A. F., Stubner, S., and Pinkwart, A., The influence of a digital strategy on the digitalization of new ventures: The mediating effect of digital capabilities and a digital culture. *Journal of Small Business Management*, Vol. 0, no. 0, pp. 1–29, 2021.
- Purwanto, A., The Role of Digital Leadership, e-loyalty, e-service Quality and e-satisfaction of Indonesian E-commerce Online Shop. *International Journal of Social and Management Studies*, vol. 3, no. 5, pp. 51–57, 2022
- Sahputra, D., Lumbantobing, P., and Tuppla, C. P., Assessment of the quality of independent nursing practice in Indonesia based on total quality management indicators. *Belitung Nursing Journal*, vol. 7, no. 4, pp. 294–303, 2021
- Sayaf, A. M., Alamri, M. M., Alqahtani, M. A., and Al-Rahmi, W. M., Information and Communications Technology Used in Higher Education: An Empirical Study on Digital Learning as Sustainability. *Sustainability*, vol. 13, no. 13, 2021.
- Shivdas, A., Barpanda, S., Sivakumar, S., and Bishu, R., Frugal innovation capabilities: Conceptualization and measurement. *Prometheus*, vol. 37, no. 3, pp. 259-285, 2021.
- Soliman, A. F., A proposed model for leadership styles effect on total quality management implementation: An applied study on telecommunication for mobile service companies in Egypt. *International Journal of Productivity and Quality Management*, vol. 24, no. 3, pp. 373–397, 2018.
- Tedla, B. A., Redda, E. H., and North-West University, South Africa. (2022). Teacher professionalism as an impetus for teacher leadership to lead schools: A retrospective study. *Eurasian Journal of Social Sciences*, 10(1), pp. 1–15, 2022.
- Temiz, T. N. D., Kara (Sivuk), D., and Potas, N., Moderating Effects of Gender Relationship Between Quality of Work Life and Job Satisfaction: Total Quality Management Perceptions as a Mediating Factor. *Journal of Health Management*, vol. 23, no. 4, pp. 696–714, 2021.

- W Wasono, L., and Furinto, A., The effect of digital leadership and innovation management for incumbent telecommunication company in the digital disruptive era. *International Journal of Engineering & Technology*, vol. 7, no. 2.29, 125-130, 2018.
- Wang, L. L., and Gao, Y., Competition network as a source of competitive advantage: The dynamic capability perspective and evidence from China. *Long Range Planning*, vol. 54, no. 2, 2021.
- Xin, X., Zheng, X., Lu, H., Yang, Q., Sun, Y., Qu, K., Guo, Y., and He, H., A study on the management of needle-stick and sharps injuries based on total quality management in a tertiary hospital in western China. *The Journal of Vascular Access*, vol. 22, no. 2, pp. 273–279, 2021.
- Yazdani, B., TQM, employee outcomes and performance: The contingency effect of environmental uncertainty. *International Journal of Quality & Reliability Management*, vol. 39, no. 2, pp. 647–672, 2021.
- Zhang, C., Moreira, M. R. A., and Sousa, P. S. A., A bibliometric view on the use of total quality management in services. *Total Quality Management & Business Excellence*, vol. 32, no. 13–14, pp. 1466–1493, 2021.
- Zhen, Z., Yousaf, Z., Radulescu, M., and Yasir, M., Nexus of Digital Organizational Culture, Capabilities, Organizational Readiness, and Innovation: Investigation of SMEs Operating in the Digital Economy. *Sustainability*, vol. 13, no. 2, pp. 720, 2021.
- Zhong, L., Indicators of Digital Leadership in the Context of K-12 Education. *Journal of Educational Technology Development and Exchange (JETDE)*, vol. 10, no. 1, pp. 27–40, 2017.

Biographies

Stefanus Rumangkit completed a bachelor's degree at Sanata Dharma University and a master's degree at Universitas Gadjah Mada. Currently, he works as a faculty member at Bina Nusantara University and as an assistant professor. Apart from being a lecturer, he is the co-founder of Bina Desa Indonesia, a non-profit organization that aims to empower rural communities. Through Bina Desa Indonesia, he contributes to providing training to village residents to create new businesses to improve the family economy. While working as a lecturer, he taught courses on human resource management and operations management. Stefanus Rumangkit's contribution to the development of science in his field has been published in several publications, namely: *International Journal of Supply Chain Management*, *International Journal of Psychosocial Rehabilitation*, *Diponegoro International Journal of Business*, *Technobiz: International Journal of Business*, and *Darmajaya Business Journal*. In 2020 and 2021, he was trusted by the Ministry of Education and Culture of the Republic of Indonesia to conduct research related to the tourism village model based on community-based tourism and total quality management for education-based tourism villages. Currently, he is also a reviewer of several journals, namely: *Bisnis Manajemen Informatika Journal*, *Ilmu Kesehatan dan Konsumen Journal*, *Widya Cipta Journal*, and *Ilmiah Administrasi Journal*.

Antonius Satria Hadi holds a bachelor's degree from Sanata Dharma University and a master's degree from Universitas Gadjah Mada. He has worked full-time at Widya Mataram University since 2018 and previously held positions at several big companies in Indonesia, such as MNC Finance, Kompas Gramedia Group, and Sinar Sosro Corp. His specialization is in entrepreneurial marketing. He is currently a PhD student at the University of Kuala Lumpur, Malaysia. He has published articles on topics such as entrepreneurship and innovation, entrepreneurial marketing, consumer behavior, and tourism management in several journals such as *Asian Management and Business Review*, *Maksipreneur Journal*, *Modus Journal*, and *Darmajaya Business Journal*. He was a unit manager at Sinar Sosro corp for a couple of years. Moreover, several years of experience in building networks. He also has been the supervisor of the advertising division at Kompas Gramedia Group. Furthermore, he is also an assistant professor and currently in charge head of marketing for the Faculty of Economy, Widya Mataram University, Indonesia. Antonius Satria Hadi has recently given public training or talks on digital marketing and entrepreneurship hosted by the Ministry of Communication and Informatics, Republic of Indonesia. He is an Editorial Board member of several nationally accredited journals in Indonesia.