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ENHANCING FINANCIAL PERFORMANCE THROUGH BIG DATA ANALYTICS CAPABILITY, SUPPLY CHAIN AGILITY AND SUPPLY CHAIN PERFORMANCE IN THE HOTEL INDUSTRY

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Abstract

The aim of this study was to construct a causal model that investigates the association between big data analytics capability (BDAC), supply chain agility (SCA), supply chain performance (SCP), and financial performance (FP), in the hotel industry. Additionally, it examines the mediator functions of SCA and SCP in the correlation between BDAC and FP. The study collected data from 324 hotel entrepreneurs who participated by completing online surveys. The gathered data were subsequently examined using PLS-SEM. The results demonstrate that BDAC has a direct favorable impact on SCA, SCP, and FP, while SCA also has a positive effect on both SCP and FP. Both SCA and SCP were found to significantly mediate the relationship between BDAC and FP. These findings indicate that hotel owners should utilize customer service data for thorough analysis to determine the most effective operational solutions and improve their BDAC. This method has the potential to enhance SCA, SCP, and eventually, yield superior financial performance. The study enhances our understanding of the function of BDAC in improving performance in hotel businesses. It also offers practical implications for hotel management.

Keywords: Big Data Analytics Capability, Supply Chain Agility, Supply Chain Performance, Financial Performance.

1. INTRODUCTION

Supply chain management (SCM) has emerged as a primary strategy for organizations to improve cost management and economic performance in an increasingly competitive market (Hong et al., 2017). Simultaneously, globalization and digitalization present greater obstacles to contemporary supply chain management regarding complexity and dynamism, necessitating an elevated level of dynamic capabilities (DC) within the supply chain. Consequently, exploring the application of dynamic supply chain capabilities to enhance firm performance, grounded in a comprehensive understanding of supply chain dynamics, is a highly pertinent subject. Supply chain management in hotels involves the coordination and integration of information, materials, and financial flows among suppliers, customers, distributors, and manufacturers (Lee, 2000). The adoption and utilization of technology can be regarded as a

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dynamic capability of a firm. In the modern business environment, the capacity to evaluate big data has become an essential skill across multiple industries, including hotels. This capacity has grown increasingly important in influencing the operational and strategic framework of hotel businesses (Yadegaridehkordi et al., 2020). Big data analytics can be utilized to predict consumer occupancy rates in the hotel sector. This predictive ability is essential for improving the efficiency of hotel supply chain management (Pan & Yang, 2017).

Efficient supply chain strategies significantly contribute to financial performance, with adaptable and economical supply chains enhancing business outcomes (Qrunfleh & Tarafdar, 2013). As contemporary supply chains become more interconnected, they generate vast amounts of data, necessitating a focus on big data analytics. Researchers have asserted that the abilities of big data analytics are essential for supply chain agility (Aljumah, 2022) and firm and supply chain performance (Wamba et al., 2016; Tipu & Fantazy, 2023). The hotel sector, in particular, requires timely information exchange with supply chain participants for efficient inventory management and client responsiveness. This underscores the importance of well-developed organizational big data analytics capabilities to convert raw data into actionable insights. Supply chain agility, alongside robust performance, is crucial for enhancing organizational outcomes (Liu et al., 2013). It encompasses not only quick responses to changes but also the capacity to adapt to dynamic market conditions and pursue commercial opportunities. Çetindaş et al. (2023) established that supply chain agility had a notable beneficial effect on financial performance during the COVID-19 pandemic, underscoring its significance in atypical circumstances. Supply chain agility in the hotel business has demonstrated the capacity to improve operational, economic, and environmental performance.

This study examines the effects of big data analytics capability on supply chain agility, performance, and financial outcomes in the hotel industry, including the mediating roles of supply chain agility and performance. The findings will provide hotel operators with crucial insights for informed decision-making and strategy formulation, ultimately enhancing financial performance, fostering sustainable competitive advantages, and contributing to economic growth.

2. LITERATURE REVIEW

2.1 Dynamic Capability

The ability to develop fresh capabilities is fundamentally the dynamic capability of the organization (Hong et al., 2017). Teece et al. (1997) characterize dynamic capabilities as a combination of the capacities to integrate, develop, and reorganize internal and external skills to respond to swiftly evolving settings. The dynamic capabilities theory extends the resource-based view (RBV), which focuses on the selection of suitable resources. In contrast, the dynamic capabilities theory prioritizes the development and renewal of such resources. The dynamic capabilities theory is combined with the resource-based view to demonstrate the attainment of a competitive advantage in the supply chain (Squire et al., 2009). Gao and Sarwar (2022) suggest that firms must create big data analytic management capability to potentially impact their dynamic capabilities. Consequently, we may assert that the capability of analyzing big data is a contributing aspect to the organization's dynamic capabilities.

2.2 Big Data Analytics Capability (BDAC)

BDAC has become increasingly crucial for operational decision-making in firms. Dubey et al. (2019) highlight its volume and diversity as key characteristics enabling effective analysis and extraction of operational insights. This analytical approach integrates, manages,

processes, and analyzes various data elements to develop strategies for sustainability, efficiency, and the development of a competitive advantage. Kabil (2021) defines it as systematic procedures for analyzing extensive datasets to uncover novel information for improved decision-making. Organizational big data analytics capability, as described by Mikalef et al. (2020), encompasses the ability to gather, manage, analyze, and store data for innovation development. This capability is vital for organizational success in innovation, competitiveness, and productivity. In supply chain management, it can enhance agility (Dubey et al., 2019) and performance, while also potentially improving organizational performance across finance, marketing, and innovation domains.

2.3 Supply Chain Agility (SCA)

Companies are placing greater emphasis on improving their capacity to handle increasing business risks, namely by enhancing the productivity and adaptability of critical operations such as supply chain management, which have a substantial impact on the costs of the company. Studies on supply chain agility, which is an important component of organizational agility, have increased (Swafford et al., 2006). SCA pertains to the ability of an enterprise to rapidly adapt its strategies and processes in response to market fluctuations and external influences (Gligor et al., 2015). Efficient supply chain management necessitates adaptability to accommodate various requirements, while utilizing big data helps to optimize these procedures. Having a robust big data analytics capability allows companies to enhance quality and effectively navigate external uncertainties.

2.4 Supply Chain Performance (SCP)

SCP, as defined by Banomyong and Supatn (2011), assesses the effectiveness of supply chain participants, with a specific emphasis on their ability to integrate and coordinate. Key performance indicators encompass metrics such as client demand fulfillment, punctual delivery, product availability, inventory control, and manufacturing capacity optimization. Efficient performance of the supply chain generates customer value, provides competitive advantages, and improves corporate marketing success. According to Ali et al. (2023), enhancing performance of the supply chain is essential for achieving superior organizational results. Al-Shboul et al. (2017) presented a comprehensive method for assessing the effectiveness of a supply chain, focusing on four crucial factors: flexibility, integration, customer responsiveness, and supplier capability. Effective supply chains result in the development of value for customers, sustained competitive advantages, and enhanced marketing performance.

2.5 Financial Performance (FP)

There are two perspectives to consider: from a financial standpoint and from a non-financial standpoint. Financial performance is evaluated by assessing a company's capacity to achieve its financial objectives. This evaluation is often done by analyzing metrics such as assets, equity, revenues, and profitability (Awaysheh et al., 2020). Crucial measures to take into account are ROI, return on sales, profit margins, and net profit (Stainer & Stainer, 1998). Although financial performance is crucial for comprehending total business achievement, depending exclusively on financial measurements can be deceptive, as corporations cover various dimensions. FP measurements are frequently employed in empirical research to evaluate the influence of different organizational practices and tactics.

2.6 Hypothesis Development

In order to efficiently evaluate massive datasets, organizations must improve their technical expertise, management of technology, and managerial skills. According to Aljumah (2022), having the ability to analyze large amounts of data is extremely important for enhancing the flexibility and responsiveness of supply chains. Mandal (2019) found that incorporating big data analytics into planning, coordination, and control, significantly enhances supply chain agility. Similarly, Srimarut and Mekhum (2020) investigated this relationship in Thailand's manufacturing industry, while Vitari and Raguseo (2019) provided evidence that big data analytics enhances financial and market performance. In addition, Yasmin et al. (2020) highlighted the accuracy and reliability of big data analytics in forecasting future events, hence improving the effectiveness of supply chain operations. Given the results obtained, the subsequent hypotheses are proposed:

H1: BDAC positively impacts SCA
H2: BDAC positively impacts FP
H3: BDAC positively impacts SCP

Dhaigude and Kapoor (2017) assert that modern supply chain effectiveness hinges on the adaptability of individual members, underscoring the importance of flexibility in today's dynamic business environment. Jajja et al. (2018) suggest that supply chain agility impacts a company's cost efficiency, enabling supply chain processes with fewer resources. This agility, achieved through cost efficiency, creates value for the supply chain. Moreover, agility enhances a firm's capability to provide superior products, competitive service levels, and efficient, timely deliveries at reasonable costs, thereby improving supply chain performance. Agility is widely acknowledged as a critical factor that influences market performance (Liu et al., 2013). Based on these observations, the following hypotheses are proposed:

H4: SCA positively impacts SCP
H5: SCA positively impacts FP

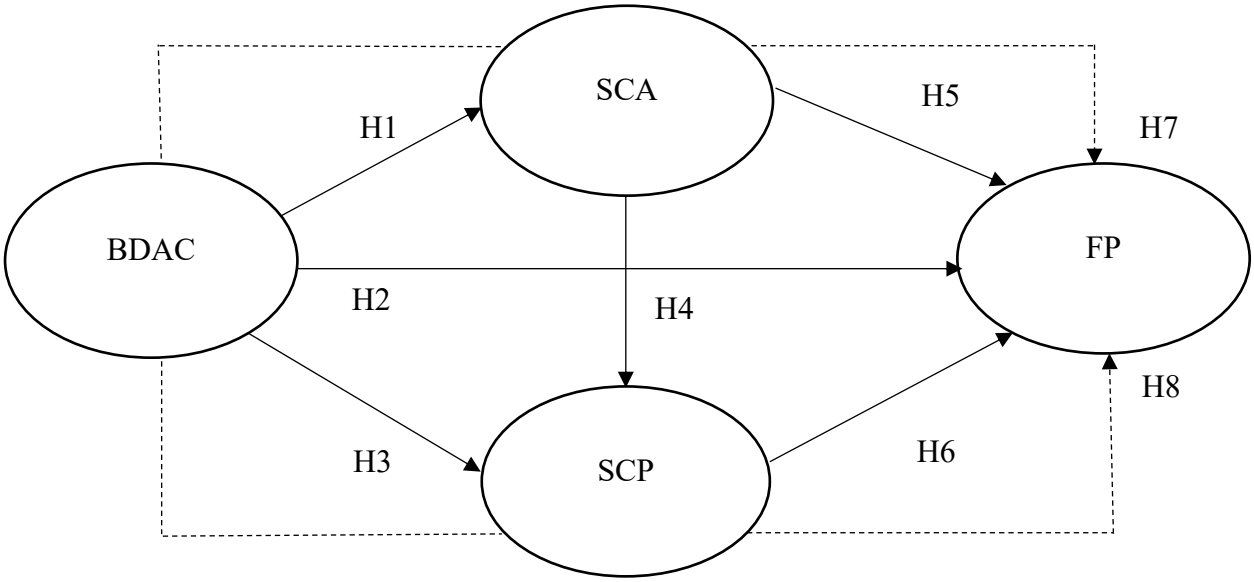
Various studies have discovered a clear and direct link between the performance of a supply chain and the overall effectiveness of a firm (Vanpoucke et al., 2017). An efficient supply chain's capacity to meet consumer needs, effectively improves business results. Qrunfleh and Tarafdar (2013) showed that a supply chain that is cost-effective, reliable, adaptable, and responsive can enhance organizational outcomes. Ali et al. (2023) indicated that robust supply chain performance is essential for enhancing overall organizational performance, especially regarding financial measures, which serve as important markers of company success. Given this information, the following hypothesis is proposed:

H6: SCP positively impacts FP

Supply chain effectiveness has become crucial in commercial competition, with agility being a critical aspect for achieving corporate success (Defee & Stank, 2005). Supply chain agility is frequently regarded as a facilitator in enhancing performance. Dhaigude and Kapoor (2017) provided evidence for the complete mediation of the link between supply chain orientation and performance in Indian manufacturing by agility. This study emphasizes the advantages of effective supply chain management, seeking to investigate the relationship between big data analytics capability, supply chain agility, performance, and financial performance in the hotel industry. It attempts to build upon prior studies by examining the role of supply chain agility and performance in these relationships. Consequently, the following hypotheses were formulated:

H7: SCA serves as an intermediary in the relationship between BDAC and FP
H8: SCP serves as an intermediary in the relationship between BDAC and FP.

Figure 1 Conceptual Framework and Hypotheses



3. RESEARH METHODOLOGY

In the first quarter of 2024, the service sector had a significant impact on Thailand's economy, accounting for 61.8% of the country's GDP (Office of the National Economic and Social Development Council [NESDC], 2024a). Within this sector, the hotel and restaurant industry demonstrated significant growth, with a rate of 11.8%, following a 9.8% increase in the previous quarter. The hotel services sector, in particular, experienced a remarkable 26.7% growth rate, driven by an increase in both domestic and international tourist visits (Office of the National Economic and Social Development Council [NESDC], 2024b). However, despite this growth, the Department of Business Development (2024a) reported that over 65% of hotel owners recorded continuous financial losses for three consecutive years (2020-2022). This situation underscores the operational challenges and long-term viability issues faced by the hotel sector, which is crucial to the country's economic supply chain. Consequently, there is an urgent need to develop strategies to enhance the financial performance of hotel businesses, ensuring their long-term survival and contribution to national economic growth.

3.1 Population and Sample

This organizational-level study focuses on registered and operating hotel business operators in Thailand, with a population of 17,193 firms (Department of Development, 2024b). Following Kline's (2011) recommendations for structural equation modeling, a sample size exceeding 200 was deemed suitable. Data collection employed an online survey, distributed via Google Forms, using purposive sampling of registered hotel operators who provided email information to the Department of Business Development. Of the 334 responses received, 10 multivariate outliers were removed using the Mahalanobis distance approach (Hair et al., 2019a), resulting in a final dataset of 324 valid responses for analysis.

3.2 Measurement and Questionnaire Design

A survey-based method was utilized to evaluate the conceptual framework and test the hypotheses. The measures for each construct were arranged in a survey questionnaire utilizing a seven-point Likert scale. The survey instrument underwent a pre-testing phase with three specialists, including one academic and two industry professionals, who possess expertise and experience in the hotel business. The research questionnaire consisted of two core sections: (1) The demographic information, which included five items: the respondent's job title, the number of employees, the average revenue of the firm in the last three years, the length of employment, and the period of time the business has been established. (2) Measures that were specifically constructed for the survey's purpose, including: big data analytics capability, measured using 8 items (Al-Khatib, 2022; Shamim et al., 2020; Srinivasan & Swink, 2018); supply chain agility, assessed through 8 items (Chen, 2019; Gligor et al., 2015); supply chain performance, evaluated using 11 items (Al-Shboul et al., 2017); and financial performance, measured with 5 items (Santos & Brito, 2012). Instrument validity was assessed using the index of item objective congruence (IOC), with all items scoring above 0.5. Reliability was confirmed through a pilot study (n = 40), achieving Cronbach's alpha coefficients ranging from 0.938 to 0.970.

3.3 Data Analysis

The study utilized SmartPLS 4.0 to assess the model using PLS-SEM. chosen for its ability to elucidate intricate connections while avoiding issues of unacceptable solutions and factor indeterminacy. A two-step process was implemented: first estimating the measurement model, then testing the structural model. The measurement model evaluated statistical accuracy by verifying that the values of Cronbach's alpha and composite reliability (CR) were greater than 0.70 (Hair et al., 2016). Additionally, rho_A was used instead of CR to justify the model's internal consistency (Hair et al., 2019b). Convergent validity was confirmed by verifying that the average variance extracted (AVE) values were equal to or greater than 0.5. This indicates that the latent variables accounted for at least 50% of the variance in the indicators (Hair et al., 2016). Discriminant validity was evaluated by comparing each latent variable's square root of the AVE with its correlations with other latent variables. The validity of the structural model was assessed through empirical evaluation of the given hypotheses.

4. RESULTS

Prior to assessing the findings of the investigation, a preliminary assessment of statistical concordance was conducted utilizing a structural equation model for statistical analysis. The data was deemed to follow a normal distribution, with the skewness values ranging from -0.964 to -0.519, while the kurtosis values ranged from -0.360 to 0.366, all values were within the acceptable range. Furthermore, a multicollinearity test was conducted using a Variance Inflation Factor (VIF) analysis. The results revealed that the three independent variables—BDAC, SCA, and SCP—exhibited VIF values of 8.78, 7.12, and 8.56 respectively. These values are below the widely accepted threshold of 10 proposed by Hair et al. (2019a), and commonly applied in social science research. This indicates that multicollinearity does not pose a significant concern in the proposed model, ensuring the reliability of the regression estimates. Subsequently, the data were analyzed in order to ascertain the conclusions of the study. The research findings are hereby presented:

4.1 Descriptive Statistics

The study sample comprised 324 participants, with 41.98% (n=136) holding mid-level managerial positions. Most hotels (76.54%, n=248) employed 30-100 staff members and reported average annual revenues of 50-300 million Thai Baht (83.33%, n=270). The majority of participants (56.79%, n=184) had 10-15 years of tenure at their current hotel, and 96.30% (n=312) of the sampled hotels had been operational for 5 years or longer. The sample demonstrated satisfactory levels across key variables: big data analytics capacity (mean = 4.73), supply chain agility (mean = 4.73), supply chain performance (mean = 4.76), and financial performance (mean = 4.75). Detailed descriptive statistics are presented in Table 1.

4.2 Measurement Model

The evaluation of item and inter-item consistency dependability was conducted through the utilization of outer loadings and CR tests. To provide assurance, the loadings must surpass the threshold of 0.50 (Agyabeng-Mensah et al., 2020). The CR scores surpassed the targeted threshold of 0.7, showing that the indicators of the construct accurately represent the underlying notions. Furthermore, the AVE values, which measure the degree to which each underlying construct accounts for the variability in the indicators, surpassed the recommended threshold of 0.5 (Hair, 2021). The results met the specified cut-off requirements, with outer loadings ranging from 0.825 to 0.920, CR ranging from 0.938 to 0.970, and AVE values ranging from 0.752 to 0.801. The CR and AVE values satisfy the established criteria, indicating that this research satisfies the accepted standards for convergent validity (refer to Table 1). In the subsequent stage, the measures were evaluated for their discriminant validity, which refers to the degree to which they are distinct from other variables. This is evidenced by the existence of weak connections between the measure of interest and other concept measures. Discriminant validity, in essence, helps to establish the distinctiveness of each concept. Table 2 shows that the square root of the AVE for each construct (diagonal values) is greater than the associated correlation coefficient, indicating sufficient discriminant validity (Fornell & Larcker, 1981). Additionally, the heterotrait-monotrait ratio (HTMT) was used to evaluate discriminant validity in order to increase the study's comprehensiveness. As indicated in Table 2, all HTMT ratio values fell below the suggested threshold of 0.90 (Henseler et al., 2015).

Table 1 Descriptive statistics and convergent validity

Construct / Items	Loading	Mean	CR	rho_A	AVE
BDAC		**4.73**	**0.95**	**0.91**	**0.75**
Hotel's relevant big data collection	0.87	4.57			
Hotel's data storage and processing capacity	0.90	4.69			
Hotel's big data processing technology	0.83	4.88			
Hotel's enterprise-wide big data utilization	0.87	4.59			
Hotel's use of big data for service innovation	0.88	4.74			
Hotel's data-driven operational adjustments	0.86	4.82			
Hotel staff big data analysis training	0.86	4.75			
Data visualization for hotel decision-making	0.87	4.82			
SCA		**4.73**	**0.96**	**0.92**	**0.77**
Hotel's market change responsiveness	0.89	4.69			
Swift service reliability improvement	0.88	4.73			

Rapid service capability enhancement	0.85	4.75			
Quick service model development	0.89	4.74			
Fast business environment change detection	0.85	4.80			
Rapid decision-making in changing environments	0.88	4.73			
Agile supply chain adaptation	0.87	4.73			
Short-term service capacity increase	0.89	4.71			
SCP		**4.76**	**0.97**	**0.92**	**0.77**
Customer-oriented service delivery	0.88	4.77			
Differentiated service offerings	0.87	4.76			
Service quality improvement	0.88	4.76			
Meeting hotel and market demands	0.87	4.80			
Timely customer response	0.88	4.74			
Rapid service delivery	0.87	4.73			
Quick customer needs fulfillment	0.87	4.75			
Timely supplier deliveries	0.86	4.72			
Reliable supplier performance	0.88	4.79			
Consistent supplier quality	0.88	4.73			
Cost-effective supplier deliveries	0.89	4.78			
FP		**4.75**	**0.94**	**0.88**	**0.80**
Increased net revenue	0.89	4.71			
Improved after-tax profit	0.88	4.70			
Expanded market share	0.89	4.70			
Enhanced return on investment	0.89	4.74			
Increased profit capability	0.92	4.91			

Table 2 Discriminant Validity results

	Fornell-Larcker Criterion				**Heterotrait Monotrait (HTMT)**		
	BDAC	**SCA**	**SCP**	**FP**	**BDAC**	**SCA**	**SCP**
BDAC	**0.87**				-	-	-
SCA	0.77	**0.88**			0.83	-	-
SCP	0.63	0.80	**0.88**		0.74	0.84	-
FP	0.74	0.75	0.82	**0.89**	0.79	0.81	0.86

4.3 Structural Model

The structural model was assessed utilizing a two-stage PLS-SEM approach. The assessment measures were the coefficient of determination (R-square), effect magnitude (f-square), and predictive significance (Q-square). R-square values for supply chain agility, supply chain performance, and financial performance were 0.96, 0.98, and 0.95 respectively, exceeding Cohen's (1988) 0.26 threshold for statistical significance. Effect sizes (f^2) ranged from 0.027 to 2.438 (see Table 3), with values above 0.02 considered impactful (Hair et al., 2016). Q-square values, measuring predictive relevance were 0.96, 0.96, and 0.94 for the respective constructs, indicating strong predictive significance. Model fitness was confirmed by a square root mean residual (SRMR) value of 0.03, which lies within the recommended range of < 0.08 (Hair et al., 2019b). These results collectively support the proposed model's theoretical foundations.

4.4 Hypothesis Testing

The estimation of path coefficients is the final stage in evaluating the structural model and aligns with the process of hypothesis testing. The final results of the hypothesis assessment, as shown in Table 3 and Figure 2, confirm the reasonableness of 8 significant hypotheses. All pathways exhibited statistical significance at the 0.001 level. The findings from the analysis of the research hypotheses demonstrate that the BDAC positively impacts SCA (ß = 0.978), FP (ß = 0.403), and SCP (ß = 0.439). Furthermore, the SCA positively impacts on both SCP (ß = 0.555) and FP (ß = 0.321). SCP positively impacts FP (ß = 0.255). Consequently, hypotheses H1–H6 were confirmed (refer to Table 3 and Figure 2).

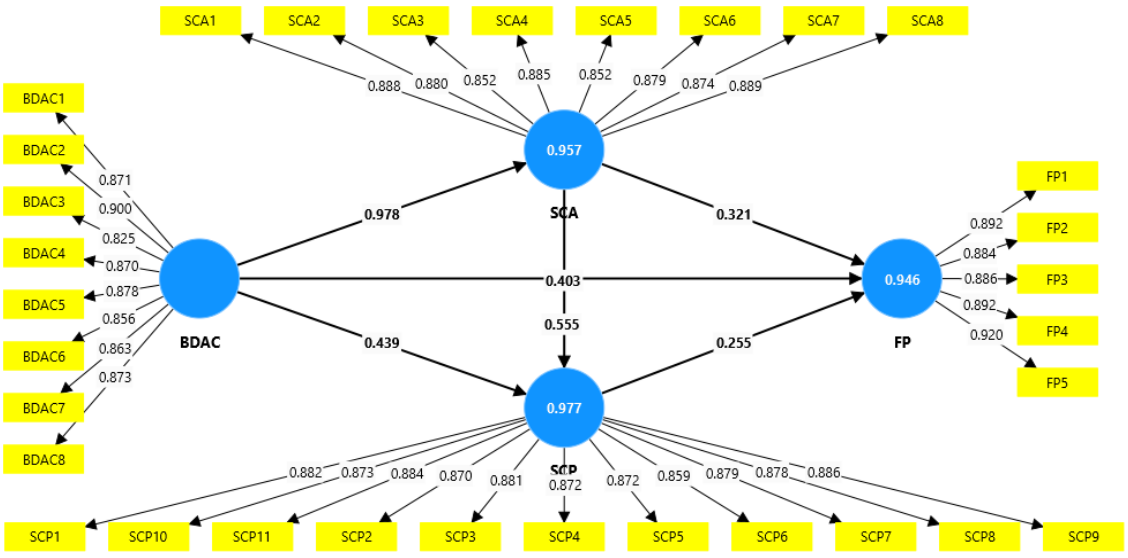
4.5 Mediation Effect

This study examined two hypotheses pertaining to mediation. The results suggest that SCA plays a role in connecting BDAC and FP. The statistical analysis shows a significant positive link (ß = 0.315). Furthermore, it has been found that the SCP serves as a mediator in the correlation between the BDAC and the FP, with a coefficient of 0.112. The findings demonstrated a notable correlation between the capability for BDAC and FP. This link was partially influenced by both SCA and SCP, as shown in Table 3 and Figure 2.

Table 3 Hypothesis testing outcomes

Hypothesis	Relationship	Beta	f^2	P-value
Direct effect				
1	BDAC → SCA	0.978	2.438	0.000
2	BDAC → FP	0.403	0.094	0.000
3	BDAC → SCP	0.439	0.364	0.000
4	SCA → SCP	0.555	0.582	0.000
5	SCA → FP	0.321	0.052	0.000
6	SCP → FP	0.255	0.027	0.000
Indirect effect				
7	BDAC → SCA → FP	0.315		0.000
8	BDAC → SCP → FP	0.122		0.000

Figure 2 Results of the Structural Equation Model



5. DISCUSSION

The findings of this study provide useful insights into the interrelationships between BDAC, SCA, SCP, and FP in the hotel industry.

The results from hypothesis 1–3 provide significant evidence supporting the beneficial influence of big data analytics capacity on supply chain agility, performance, and financial outcomes in the hotel business. This feature allows hotel operators to gain immediate and accurate understanding of market patterns, consumer preferences, and interruptions in the supply chain. This enables them to make prompt and knowledgeable decisions. Hotels may optimize their agility, operational efficiency, uncover novel revenue streams, and enhance financial performance by utilizing big data and implementing data-driven initiatives. Moreover, robust big data analytics improves the effectiveness of supply chain operations, heightens customer satisfaction, and strengthens supplier collaboration. The results are consistent with prior studies that highlight the substantial influence of big data analytics on enhancing the flexibility of the supply chain (Mandal, 2019; Wamba & Akter, 2019), the financial performance (Gunasekaran et al., 2017; Vitari & Raguseo, 2019), and the overall performance of the supply chain (Kamble & Gunasekaran, 2019; Narwane et al., 2021).

Based on hypothesis 4 - 5, the study supports the concept that supply chain agility has a favorable impact on both supply chain and financial performance. It emphasizes the crucial role of supply chain agility in enabling hotels to quickly adapt to market changes, satisfy customer needs, and optimize supply chain activities. Furthermore, the implementation of agile supply chains improves the competitive edge and financial performance of hotels. The findings of this study are consistent with previous research that emphasizes the crucial importance of supply chain agility in improving supply chain performance (Jajja et al., 2018; Çetindaş et al., 2023) and financial performance (Chan et al., 2017; DeGroote & Marx, 2013).

Regarding hypothesis 6, supply chain performance positively impacts financial performance by improving operational efficiency, reducing costs, and increasing customer satisfaction. This suggests that a hotel with strong supply chain performance will contribute to improved financial performance, hence enhancing the hotel's operational efficiency. This finding aligns with previous research by Qrunfleh and Tarafdar (2013), which demonstrated that effective supply chain performance enables firms to meet market demands efficiently, leading to higher sales revenue and profit margins. Ali et al. (2023) also highlighted that high supply chain performance is crucial for achieving superior financial performance by enhancing cost efficiency and service quality.

Moreover, the study's results support hypotheses H7 and H8, indicating that supply chain agility and supply chain performance serve as significant mediators in the relationship between big data analytic capability and financial performance with coefficients of 0.315 and 0.122 respectively. Nevertheless, the results show that the direct impact of big data analytic capability on financial performance was quantified at 0.403, while the indirect impact of big data analytic capability on financial performance, mediated by agility and supply chain performance, demonstrated a lower coefficient of influence. This evaluation of financial performance can be seen as holistic, suggesting that other factors may affect financial outcomes, which explains the reduced indirect impact. This reasoning is in strong agreement with the results outlined in the marketing studies carried out by Lee and Jang (2007) and Denizci and Li (2009). This implies that big data analytics capabilities have both direct and indirect effects on financial performance by improving supply chain performance and agility. By developing their BDAC, hotels can indirectly improve their financial outcomes by strengthening their supply chain capabilities. This finding aligns with previous research by Abourokbah et al. (2023) which discovered that supply chain agility can serve as a mediator in the connection between a company's capacity to acknowledge the worth of fresh information

utilizing it for commercial goals, and the level of innovation achieved in the supply chain of enterprises in Saudi Arabia. Moreover, research conducted by Gandhi et al. (2017) revealed that supply chain performance plays a crucial role as a mediator in the connection between information sharing and corporate success in the retail industry in India. Overall, the findings of this study emphasize the importance of adopting a holistic approach to driving financial performance in the hotel industry. Specifically, hotels should focus on building their BDAC, enhancing supply chain agility, and improving overall supply chain performance, to achieve sustainable competitive advantages and superior financial results.

6. CONCLUSION AND RECOMMENDATIONS

This quantitative study aimed to enhance the financial performance of Thai hotel sector operators by examining supply chain performance, supply chain agility, and big data analytics capability. The sample of 324 hotel owners demonstrated high proficiency in these areas, though improvements are still necessary to reach optimal operational efficiency. PLS-SEM analysis revealed that BDAC positively affects SCA, SCP, and FP, while SCA positively influences both SCP and FP, and SCP directly impacts FP. Notably, SCP and SCA significantly mediate the relationship between BDAC and FP.

6.1 Theoretical Contributions

This study improves the comprehension of big data analytics skills within the hotel business in Thailand, establishing strong connections between big data analysis capacity, supply chain agility, supply chain performance, and financial performance. These findings provide a reference point for scholars researching data analytics capabilities, enabling the construction of alternative causal models and expansion into other service sectors. Furthermore, the study validates the mediating roles of supply chain agility and performance in the relationship between big data analytics capabilities and financial performance. This insight serves as a valuable reference for researchers investigating similar mediating relationships in various contexts. These results can be utilized as a foundation for developing hypotheses and alternative causal models, broadening the understanding and applicability of such studies across different industries.

6.2 Practical Implications

Thailand is globally acknowledged as a top tourist hotspot, with the hotel business being a vital part of the country's tourism network. Therefore, hotel operators must determine suitable plans, techniques, and operational practices to achieve positive financial results and efficiently stimulate the country's tourist supply chain. This research provides four key recommendations that hotel executives should adopt as essential operational principles:

First, hotel executives should develop robust big data analytics capabilities by investing in efficient data storage and analytics technology. Moreover, implementing staff training programs to enhance proficiency in analytical tools and data interpretation is essential. Hotel businesses should establish clear criteria for customer data collection while ensuring data protection and privacy, in turn utilizing empirical data to improve decision-making processes. This approach can lead to increased supply chain flexibility, improved overall supply chain efficiency, and enhanced financial outcomes, potentially yielding long-term benefits for all stakeholders in the hotel chain.

Secondly, supply chain agility impacts both supply chain and financial performance of Thai hotel operators. Hotel executives should establish supply chains that swiftly adapt to

market fluctuations and changing client demands, improving their capacity to handle temporary service needs during high-volume periods. In addition, it is necessary to prioritize flexibility and quick decision-making to allow for adjustment to evolving operational situations. These enhancements can significantly improve supply chain performance, particularly in meeting consumer expectations and collaborating with suppliers. Improved supply chain agility can lead to enhanced financial performance, which is crucial for the sustained operation of hotel enterprises.

Thirdly, enhancing supply chain performance is vital for improving financial outcomes in the hotel industry. Key factors include flexibility, customer responsiveness, and supplier capability. Hotel executives should focus on operational flexibility by offering unique services, continuously refining offerings, and adopting a customer-centric approach. Ensuring readiness to meet customer demands and adapting to changing needs is crucial for responsiveness, which may require dynamic service models and staff training. Additionally, hotel operators should assess supplier capabilities, emphasizing delivery speed and reliability, while regularly evaluating quality and cost to maintain operational efficiency. These strategies will contribute to consistent and reliable financial performance.

Fourthly, a crucial discovery of this study is the mediating role of supply chain agility and supply chain performance. In order to fully utilize and incorporate these research findings, hotel owners must implement big data analytics capabilities into their businesses. This application seeks to improve the agility of the supply chain by providing a more responsive approach to changes among the parties involved and increasing the efficiency of supply chain performance. This encompasses the augmentation of service flexibility, the provision of prompt customer service, and the improvement of supplier abilities. Enhancing agility and efficiency in the supply chain of hotels can result in enhanced financial performance, including increased net revenue, after-tax profit (net profit), and hotel operators' enhanced ability to generate profits. In conclusion, this strategy can assist hotel operators in augmenting their market dominance.

6.3 Limitations

This study focused solely on the financial performance of hotel businesses. Future research could consider examining both financial and non-financial performance metrics of hotels to provide a more comprehensive understanding of the industry's overall performance. The current study collected data exclusively from hotels registered with Thai government agencies. Future research might consider expanding the scope to include both registered and unregistered hotels, thereby providing a more inclusive and extensive study of the sector. This research did not examine moderating variables such as hotel size or the distinction between international and national hotel chains. Future studies could incorporate these factors as moderators to provide more nuanced and in-depth analyses of the relationships between variables. The present study employed PLS-SEM for structural equation modeling, primarily focusing on predicting variable effects. Future research could consider applying CB-SEM to confirm the theoretical model, potentially yielding additional valuable insights and enhancing the theoretical contributions of the research.

REFERENCES

Abourokbah, S. H., Mashat, R. M., & Salam, M. A. (2023). Role of absorptive capacity, digital capability, agility, and resilience in supply chain innovation performance. *Sustainability*, *15*(4), 3636. https://doi.org/10.3390/su15043636

Agyabeng-Mensah, Y., Ahenkorah, E., Afum, E., Dacosta, E., & Tian, Z. (2020). Green warehousing, logistics optimization, social values and ethics and economic performance: the role of supply chain sustainability. *The International Journal of Logistics Management*, *31*(3), 549–574. https://doi.org/10.1108/ijlm-10-2019-0275

Ali, E., Jianhua, L., Rasheed, M., & Siraj, A. (2023). Measuring the impact of integration practices on firms' supply chain performance: role of organizational antecedents in this relationship. *Arab Gulf Journal of Scientific Research*, *41*(3), 293–314. https://doi.org/10.1108/agjsr-10-2022-0232

Aljumah, A. I. (2022). Exploring nexus among big data analytic capability and organizational performance through mediation of supply chain agility. *Uncertain Supply Chain Management*, *10*(3), 999–1008. https://doi.org/10.5267/j.uscm.2022.2.013

Al-Khatib, A. W. (2022). Big data analytics capabilities and green supply chain performance: investigating the moderated mediation model for green innovation and technological intensity. *Business Process Management Journal*, *28*(5/6), 1446–1471. https://doi.org/10.1108/bpmj-07-2022-0332

Al-Shboul, M. a. R., Barber, K. D., Garza-Reyes, J. A., Kumar, V., & Abdi, M. R. (2017). The effect of supply chain management practices on supply chain and manufacturing firms' performance. *Journal of Manufacturing Technology Management*, *28*(5), 577–609. https://doi.org/10.1108/jmtm-11-2016-0154

Awaysheh, A., Heron, R. A., Perry, T., & Wilson, J. I. (2020). On the relation between corporate social responsibility and financial performance. *Strategic Management Journal*, *41*(6), 965–987. https://doi.org/10.1002/smj.3122

Banomyong, R., & Supatn, N. (2011). Developing a supply chain performance tool for SMEs in Thailand. *Supply Chain Management an International Journal*, *16*(1), 20–31. https://doi.org/10.1108/13598541111103476

Çetindaş, A., Akben, B., Özcan, C., Kanuşağı, L., & Öztürk, O. (2023). The effect of supply chain agility on firm performance during COVID-19 pandemic: the mediating and moderating role of demand stability. *Supply Chain Forum an International Journal*, *24*(3), 307–318. https://doi.org/10.1080/16258312.2023.2167465

Chan, A. T., Ngai, E. W., & Moon, K. K. (2017). The effects of strategic and manufacturing flexibilities and supply chain agility on firm performance in the fashion industry. *European Journal of Operational Research*, *259*(2), 486–499. https://doi.org/10.1016/j.ejor.2016.11.006

Chen, C. J. (2019). Developing a model for supply chain agility and innovativeness to enhance firms' competitive advantage. *Management Decision*, *57*(7), 1511–1534. https://doi.org/10.1108/md-12-2017-1236

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences (2nd ed.)*. Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Defee, C. C., & Stank, T. P. (2005). Applying the strategy-structure-performance paradigm to the supply chain environment. *The International Journal of Logistics Management*, *16*(1), 28–50. https://doi.org/10.1108/09574090510617349

DeGroote, S. E., & Marx, T. G. (2013). The impact of IT on supply chain agility and firm performance: An empirical investigation. *International Journal of Information Management*, *33*(6), 909–916. https://doi.org/10.1016/j.ijinfomgt.2013.09.001

Denizci, B., & Li, X. (2009). Linking marketing efforts to financial outcome: an exploratory study in tourism and hospitality contexts. *Journal of Hospitality & Tourism Research*, *33*(2), 211–226. https://doi.org/10.1177/1096348008329871

Department of Business Development. (2024a). Financial statements business type 55101 hotels, resorts and apartments. (Information as of June 13, 2024). Retrieved from https://datawarehouse.dbd.go.th/business/55101?type=business

Department of Business Development. (2024b). DBD DataWarehouse+. (Information as of June 12, 2024). Retrieved from https://datawarehouse.dbd.go.th/searchJuristicInfo/55101/submitObjCode/1

Dhaigude, A., & Kapoor, R. (2017). The mediation role of supply chain agility on supply chain orientation-supply chain performance link. *Journal of Decision System*, *26*(3), 275–293. https://doi.org/10.1080/12460125.2017.1351862

Dubey, R., Gunasekaran, A., & Childe, S. J. (2019). Big data analytics capability in supply chain agility. *Management Decision*, *57*(8), 2092–2112. https://doi.org/10.1108/md-01-2018-0119

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39–50. https://doi.org/10.1177/002224378101800104

Gandhi, A. V., Shaikh, A., & Sheorey, P. A. (2017). Impact of supply chain management practices on firm performance. *International Journal of Retail & Distribution Management*, *45*(4), 366–384. https://doi.org/10.1108/ijrdm-06-2015-0076

Gao, J., & Sarwar, Z. (2022). How do firms create business value and dynamic capabilities by leveraging big data analytics management capability? *Information Technology and Management*, *25*(3), 283–304. https://doi.org/10.1007/s10799-022-00380-w

Gligor, D. M., Esmark, C. L., & Holcomb, M. C. (2015). Performance outcomes of supply chain agility: When should you be agile?. *Journal of Operations Management*, *33–34*(1), 71–82. https://doi.org/10.1016/j.jom.2014.10.008

Gunasekaran, A., Papadopoulos, T., Dubey, R., Wamba, S. F., Childe, S. J., Hazen, B., & Akter, S. (2017). Big data and predictive analytics for supply chain and organizational performance. *Journal of Business Research*, *70*, 308–317. https://doi.org/10.1016/j.jbusres.2016.08.004

Hair, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*: Sage publications.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019a). *Multivariate data analysis (8th ed.)*: Cengage Learning.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019b). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24. https://doi.org/10.1108/ebr-11-2018-0203

Hair, J. F. (2021). Next-generation prediction metrics for composite-based PLS-SEM. *Industrial Management & Data Systems*, *121*(1), 5–11. https://doi.org/10.1108/imds-08-2020-0505

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Hong, J., Zhang, Y., & Ding, M. (2017). Sustainable supply chain management practices, supply chain dynamic capabilities, and enterprise performance. *Journal of Cleaner Production*, *172*, 3508–3519. https://doi.org/10.1016/j.jclepro.2017.06.093

Jajja, M. S. S., Chatha, K. A., & Farooq, S. (2018). Impact of supply chain risk on agility performance: Mediating role of supply chain integration. *International Journal of Production Economics*, *205*, 118–138. https://doi.org/10.1016/j.ijpe.2018.08.032

Kabil, A. M. (2021). *Integrating big data technology into organizational decision support systems*. In IGI Global eBooks (pp. 639–657). https://doi.org/10.4018/978-1-7998-9023-2.ch031

Kamble, S. S., & Gunasekaran, A. (2019). Big data-driven supply chain performance measurement system: a review and framework for implementation. *International Journal of Production Research*, *58*(1), 65–86. https://doi.org/10.1080/00207543.2019.1630770

Kline, R. B. (2011). *Principles and practice of structural equation modeling (3rd ed.)*. New York: Guilford Press.

Lee, H. L. (2000). Creating value through supply chain integration. *Supply Chain Management Review*, *4*, 30-36.

Lee, M. J., & Jang, S. (2007). Market diversification and financial performance and stability: A study of hotel companies. *International Journal of Hospitality Management*, *26*(2), 362–375. https://doi.org/10.1016/j.ijhm.2006.02.002

Liu, H., Ke, W., Wei, K. K., & Hua, Z. (2013). The impact of IT capabilities on firm performance: The mediating roles of absorptive capacity and supply chain agility. *Decision Support Systems*, *54*(3), 1452–1462. https://doi.org/10.1016/j.dss.2012.12.016

Mandal, S. (2019). The influence of big data analytics management capabilities on supply chain preparedness, alertness and agility. *Information Technology and People*, *32*(2), 297–318. https://doi.org/10.1108/itp-11-2017-0386

Mikalef, P., Krogstie, J., Pappas, I. O., & Pavlou, P. (2020). Exploring the relationship between big data analytics capability and competitive performance: The mediating roles of dynamic and operational capabilities. *Information & Management*, *57*(2), 103169. https://doi.org/10.1016/j.im.2019.05.004

Narwane, V. S., Raut, R. D., Yadav, V. S., Cheikhrouhou, N., Narkhede, B. E., & Priyadarshinee, P. (2021). The role of big data for Supply Chain 4.0 in manufacturing organisations of developing countries. *Journal of Enterprise Information Management*, *34*(5), 1452–1480. https://doi.org/10.1108/jeim-11-2020-0463

Office of the National Economic and Social Development Council. (2024a). Gross domestic product in Q1/2024 (Information as of June 11, 2024) Retrieved from https://www.nesdc.go.th/ewt_dl_link.php?nid=13216&filename=qgdp_page

Office of the National Economic and Social Development Council. (2024b). Gross domestic product in Q1/2024 (Information as of June 12, 2024) Retrieved from https://www.nesdc.go.th/ewt_dl_link.php?nid=13214&filename=qgdp_page

Pan, B., & Yang, Y. (2017). Forecasting Destination Weekly Hotel Occupancy with Big Data. *Journal of Travel Research*, *56*(7), 957–970. https://doi.org/10.1177/0047287516669050

Qrunfleh, S., & Tarafdar, M. (2013). Lean and agile supply chain strategies and supply chain responsiveness: the role of strategic supplier partnership and postponement. *Supply Chain Management an International Journal*, *18*(6), 571–582. https://doi.org/10.1108/scm-01-2013-0015

Santos, J. B., & Brito, L. A. L. (2012). Toward a subjective measurement model for firm performance. *BAR - Brazilian Administration Review*, *9*(spe), 95–117. https://doi.org/10.1590/s1807-76922012000500007

Shamim, S., Zeng, J., Khan, Z., & Zia, N. U. (2020). Big data analytics capability and decision-making performance in emerging market firms: The role of contractual and relational governance mechanisms. *Technological Forecasting and Social Change*, *161*, 120315. https://doi.org/10.1016/j.techfore.2020.120315

Squire, B., Cousins, P. D., Lawson, B., & Brown, S. (2009). The effect of supplier manufacturing capabilities on buyer responsiveness. *International Journal of Operations & Production Management*, *29*(8), 766–788. https://doi.org/10.1108/01443570910977689

Srimarut, T., & Mekhum, W. (2020). From supply chain connectivity (SCC) to supply chain agility (sca), adaptability and alignment: mediating role of big data analytics capability. *International Journal of Supply Chain Management*, *9*(1), 183–189.

Srinivasan, R., & Swink, M. (2018). An investigation of visibility and flexibility as complements to supply chain analytics: an organizational information processing theory perspective. *Production and Operations Management*, *27*(10), 1849–1867. https://doi.org/10.1111/poms.12746

Stainer, A., & Stainer, L. (1998). Business performance? a stakeholder approach. *International Journal of Business Performance Management*, *1*(1), 2. https://doi.org/10.1504/ijbpm.1998.004042

Swafford, P. M., Ghosh, S., & Murthy, N. (2006). The antecedents of supply chain agility of a firm: Scale development and model testing. *Journal of Operations Management*, *24*(2), 170–188. https://doi.org/10.1016/j.jom.2005.05.002

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, *18*(7), 509–533. https://doi.org/10.1002/(sici)1097-0266(199708)18:7

Tipu, S. a. A., & Fantazy, K. (2023). Linking big data analytics capability and sustainable supply chain performance: mediating role of innovativeness, proactiveness and risk taking. *International Journal of Productivity and Performance Management*. https://doi.org/10.1108/ijppm-11-2022-0576

Vanpoucke, E., Vereecke, A., & Muylle, S. (2017). Leveraging the impact of supply chain integration through information technology. *International Journal of Operations & Production Management*, *37*(4), 510–530. https://doi.org/10.1108/ijopm-07-2015-0441

Vitari, C., & Raguseo, E. (2019). Big data analytics business value and firm performance: linking with environmental context. *International Journal of Production Research*, *58*(18), 5456–5476. https://doi.org/10.1080/00207543.2019.1660822

Wamba, S. F., Gunasekaran, A., Akter, S., Ren, S. J., Dubey, R., & Childe, S. J. (2016). Big data analytics and firm performance: Effects of dynamic capabilities. *Journal of Business Research*, *70*, 356–365. https://doi.org/10.1016/j.jbusres.2016.08.009

Wamba, S. F., & Akter, S. (2019). Understanding supply chain analytics capabilities and agility for data-rich environments. *International Journal of Operations & Production Management*, *39*(6/7/8), 887–912. https://doi.org/10.1108/ijopm-01-2019-0025

Yadegaridehkordi, E., Nilashi, M., Shuib, L., Nasir, M. H. N. B. M., Asadi, S., Samad, S., & Awang, N. F. (2020). The impact of big data on firm performance in hotel industry. *Electronic Commerce Research and Applications*, *40*, 100921. https://doi.org/10.1016/j.elerap.2019.100921

Yasmin, M., Tatoglu, E., Kilic, H. S., Zaim, S., & Delen, D. (2020). Big data analytics capabilities and firm performance: An integrated MCDM approach. *Journal of Business Research*, *114*, 1–15. https://doi.org/10.1016/j.jbusres.2020.03.028