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Real-Time Data-Driven Decision-Making and Business Performance: The Mediating Role of Data Analytics Capability

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KEYWORDS

Business Performance;
Data Analytics;
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PLS-SEM;
Real-Time Data-Driven Decision-Making

ABSTRACT

The rapid growth of digital technologies and business data has encouraged organizations to use Real-Time Data-Driven Decision-Making (RT-DDDM) to support timely and informed decisions. This study develops and tests a simulation-based model examining the relationship between RT-DDDM, Organizational Data Analytics Capability (ODAC), and Business Performance. A quantitative PLS-SEM approach was implemented in SmartPLS using 180 simulated observations. The observations were generated for methodological practice rather than collected from actual organizational respondents. The simulation used predetermined five-point Likert response categories and an intentionally specified positive association structure among the latent constructs. Therefore, the resulting path coefficients, R^2, Q^2, validity statistics, and mediation effect are outcomes of the simulation design rather than empirical estimates of organizational populations. The simulated model produced positive and statistically significant paths from RT-DDDM to Business Performance and ODAC, and from ODAC to Business Performance. ODAC also showed a significant indirect effect, while the direct RT-DDDM–Business Performance path remained significant. These results illustrate how a mediation model can be evaluated under stated simulation assumptions. The main contribution is methodological and conceptual: the study demonstrates a PLS-SEM mediation structure while distinguishing simulation-based model behavior from empirical organizational evidence.

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ABSTRAK

Perkembangan teknologi digital dan meningkatnya volume data bisnis mendorong organisasi menggunakan *Real-Time Data-Driven Decision-Making* (RT-DDDM) untuk mendukung keputusan yang lebih cepat dan berbasis informasi. Penelitian ini mengembangkan dan menguji model berbasis simulasi yang menghubungkan RT-DDDM, *Organizational Data Analytics Capability* (ODAC), dan *Business Performance.* Pendekatan kuantitatif PLS-SEM diterapkan menggunakan SmartPLS dengan 180 observasi data simulasi. Observasi tersebut dibuat untuk keperluan latihan metodologis dan bukan berasal dari responden organisasi yang sebenarnya. Data simulasi menggunakan kategori respons Likert lima poin yang telah ditentukan dan struktur hubungan positif antarkonstruk yang ditetapkan sejak awal. Oleh karena itu, koefisien jalur, R^2, Q^2, statistik validitas, dan efek mediasi harus dipahami sebagai hasil dari desain simulasi, bukan sebagai estimasi empiris populasi organisasi. Model simulasi menghasilkan hubungan positif dan signifikan antara RT-DDDM dan Business Performance, RT-DDDM dan ODAC, serta ODAC dan Business Performance. ODAC juga menunjukkan efek tidak langsung yang signifikan, sementara hubungan langsung RT-DDDM terhadap Business Performance tetap signifikan. Hasil ini menunjukkan bagaimana model mediasi dapat dievaluasi berdasarkan asumsi simulasi yang dinyatakan secara transparan. Kontribusi utama penelitian ini bersifat metodologis dan konseptual, yaitu menunjukkan struktur model mediasi PLS-SEM dengan membedakan secara jelas perilaku model berbasis simulasi dari bukti empiris organisasi.

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Kata Kunci: Analitik Data; Kinerja Bisnis; *Organizational Data Analytics Capability; PLS-SEM; Real-Time Data-Driven Decision-Making.*

1. INTRODUCTION

The development of digital technology and the increasing volume of business data has encouraged organizations to use Real-Time Data-Driven Decision-Making (RT-DDDM) (Ardyansyah & Waluyo, 2026; Fakhira Syahputri et al., 2025; Petra et al., 2025). Unlike conventional Data-Driven Decision-Making, which may rely on periodic or historical information, RT-DDDM emphasizes the availability, interpretation, and use of current information within a short decision window. This temporal dimension matters because the value of information may decline when decisions are made after business conditions have changed. However, the speed of information use does not by itself constitute an organizational capability. Organizations also need the capability to manage, integrate, analyze, and translate data into usable information. This distinction motivates the separation between RT-DDDM as a decision process and Organizational Data Analytics Capability (ODAC) as an organizational capability.

The development of digital technology, Artificial Intelligence (AI), and data analytics has increasingly shifted companies toward data- and information-driven decision-making in a timely manner. This phenomenon is reflected in the growing use of Big Data Analytics to support managerial decision-making, improve productivity, and enhance firm performance (Gul & Al-Faryan, 2023). At the same time, AI capabilities are increasingly being utilized to accelerate decision-making processes, particularly when companies have the digital capabilities needed to support their implementation (Guthrie et al., 2025). These developments indicate that companies are not only required to have access to data but also need to be able to transform data into information that can be utilized in business processes. Recent research shows that Business Analytics Capability is associated with decision-making quality, while Data-Driven Culture, data literacy, and analytical capabilities are important factors in effectively utilizing data (Alaskar, 2024). In the Indonesian context, research also shows that Big Data Analytics Capability can support Firm Performance through improvements in Business Process Agility (Kusbianto & Darmawan, 2024). Therefore, the increasing use of timely data, AI, and analytics in business activities demonstrates that organizational capability to utilize data has become an important phenomenon in contemporary business management.

Recent literature indicates that the use of data and analytics has become an important part of organizational decision-making processes. (Szukits et al., 2023) explain that increasing investments in data and analytics have driven changes in decision-making practices, particularly through the strengthening of an analytics culture within organizations. Similarly, (Kurpiela & Teuteberg, 2023) show that Business Analytics can help organizations address the complexity of the business environment and improve the quality of planning and strategic decision-making. (Hjelle et al., 2024) also demonstrate that the quality, completeness, and timeliness of information can influence the quality of organizational decisions by increasing information satisfaction and reducing task complexity. In addition, empirical research on companies shows that higher data processing frequency is associated with improved decision quality and business outcomes, such as productivity and profitability (Fattah, 2024). These findings indicate that the rapid use of data and analytical capabilities are increasingly important in supporting more accurate and responsive decision-making processes.

From an organizational capability perspective, Organizational Data Analytics Capability can be understood as a company's ability to manage, analyze, and utilize data to support business activities. Research shows that analytics capabilities are not only related to decision-making processes but can also contribute to organizational performance. A study involving 178 managers showed that Business Analytics Capability plays a role in improving Decision-Making Performance, with Big Data Literacy and Data Analytics Competency serving as important factors in this relationship. (Alaskar, 2024) also found that Data-Driven Decision-Making influences the use of Business Analytics, particularly when organizations operate in dynamic business environments. Meanwhile, (Orero-Blat et al., 2024) demonstrated that Big Data Analytics Capabilities can support innovation and improvements in Organizational Performance. In the Indonesian context, (Kusbianto & Darmawan, 2024) found that Big Data Analytics Capability influences Firm

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Performance through Business Process Agility. These findings reinforce the view that an organization's ability to transform data into usable information is an important factor linking data-driven decision-making with improved business performance.

Previous studies have shown that Data Analytics Capability contributes to decision-making quality and Firm Performance (Ansari & Ghasemaghaei, 2023; Sindarov et al., 2023). However, studies that explicitly separate the temporal feature of Real-Time Data-Driven Decision-Making, the organizational capability required to process data, and Business Performance remain limited. The novelty of the present model is therefore not simply the inclusion of three variables in one framework. It lies in distinguishing RT-DDDM as a decision-process construct from ODAC as an organizational capability and in examining whether ODAC can represent a capability-conversion pathway between timely data use and performance.

Because the study uses simulated observations, the contribution is conceptual and methodological rather than empirical: it demonstrates how this distinction can be represented and tested in a PLS-SEM mediation model. The study aims to (1) clarify the conceptual boundary between RT-DDDM and ODAC, (2) demonstrate the proposed mediation structure using PLS-SEM, and (3) provide transparent interpretation of results obtained from simulated data. Based on these objectives, the research questions are: (1) Does RT-DDDM show a positive relationship with Business Performance in the simulated model? (2) Does RT-DDDM show a positive relationship with ODAC? (3) Does ODAC show a positive relationship with Business Performance? and (4) Does ODAC mediate the simulated relationship between RT-DDDM and Business Performance?

2. LITERATUR REVIEW

2.1 Real-Time Data-Driven Decision-Making

Real-Time Data-Driven Decision-Making (RT-DDDM) refers to a decision process in which current and rapidly available information is used to determine business actions (Xu & Lu, 2026). Its defining feature is the temporal proximity between data availability and decision use, rather than data use in general. Conventional Data-Driven Decision-Making may rely on historical, periodic, or aggregated information, whereas RT-DDDM places greater emphasis on current information and rapid organizational response. Xu and Lu (2026) show that data-driven decision-making can support value creation and firm performance. In the present study, RT-DDDM is operationalized as a decision-process construct covering the availability of current information, speed of information access, use of current information in decisions, and responsiveness to changing conditions.

2.2 Organizational Data Analytics Capability

Organizational Data Analytics Capability (ODAC) refers to an organization's ability to manage, integrate, analyze, and utilize data through organizational resources, processes, and competencies (Gao & Sarwar, 2022). Unlike RT-DDDM, ODAC is not defined by the timing of a particular decision. It represents the underlying organizational capability that enables data to be transformed into information and analytical insight. Gao and Sarwar (2022) explain that big data analytics management capability contributes to business value and organizational capabilities. Accordingly, ODAC is positioned as a capability construct, while RT-DDDM is positioned as a decision-process construct. This distinction reduces conceptual overlap between the mediator and the independent variable.

2.3 Business Performance

Business Performance refers to a company's ability to achieve its established business outcomes through improvements in efficiency, productivity, competitiveness, and financial performance. (Huang et al., 2022) found that Big Data Analytics capabilities can improve Competitive Performance through resource optimization. (Bhatti et al., 2022) also showed that data analytics capabilities can support innovation and firm

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performance. These findings indicate that data utilization can provide benefits to companies when supported by organizational capabilities that can transform information into effective business actions.

2.4 Real-Time Data-Driven Decision-Making and Organizational Data Analytics Capability

RT-DDDM requires organizational capabilities that can process current data quickly enough to support timely decisions (Khan & Fatima, 2024). From a capability perspective, repeated reliance on current information increases the need for data integration, analytical routines, and employee competencies. Thus, RT-DDDM represents the demand and use of timely information in the decision process, whereas ODAC represents the organizational capability that enables such information to be processed and utilized. Prior evidence that data integration capability and data-driven decision-making are linked in analytics-based performance models (Khan & Fatima, 2024) supports this conceptual relationship. On this basis, the simulated model specifies a positive relationship between RT-DDDM and ODAC.

2.5 Organizational Data Analytics Capability and Business Performance

ODAC can contribute to Business Performance because the capability to manage, integrate, and analyze data can improve the conversion of raw information into actionable insight (Huang et al., 2022; Xie et al., 2022). The theoretical mechanism is capability-based: better analytics capability can help organizations identify relevant information, allocate resources, and support decisions with greater analytical input. Huang et al. (2022) and Xie et al. (2022) provide evidence that analytics capabilities are associated with competitive performance and organizational agility. Accordingly, the simulated model proposes a positive relationship between ODAC and Business Performance.

2.6 The Mediating Role of Organizational Data Analytics Capability

ODAC can serve as a mechanism linking RT-DDDM and Business Performance because timely information creates value only when an organization has the capability to process and use it (Khan & Fatima, 2024). The indirect pathway therefore represents a capability-conversion mechanism: RT-DDDM emphasizes the use of current information, while ODAC represents the organizational capacity to transform that information into analytical insight and business action. The direct pathway may remain because timely information can also support faster responses without passing entirely through the broader analytics capability. Prior research on analytics capability and performance supports the general mechanism, but the present study does not claim that the mechanism has been empirically established in organizations because the observations are simulated. Therefore, H4 tests the mediation pattern within the specified simulation design.

3. RESEARCH METHOD

3.1 Research Design

This study employs a quantitative simulation design to examine the proposed relationships among Real-Time Data-Driven Decision-Making (RT-DDDM), Organizational Data Analytics Capability (ODAC), and Business Performance (BP). The study does not collect primary questionnaire responses from actual organizations. Instead, 180 simulated observations were created for methodological practice and subsequently analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS. The simulation design allows the measurement and structural model to be demonstrated under explicitly stated assumptions, but it does not provide empirical evidence about an organizational population. PLS-SEM was selected because the exercise involves latent constructs, multiple indicators, direct paths, and a mediation relationship. The analysis included measurement-model assessment, structural-model assessment, and bootstrapping for direct and indirect effects (Guenther et al., 2023; Ringle et al., 2023).

3.2 Population and Sample

Because this is a simulation study, there is no empirical population, respondent recruitment, or purposive sampling procedure (Jhantasana, 2023). The unit represented by each observation is a hypothetical organizational data user. A total of 180 observations were generated to provide a synthetic dataset for

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demonstrating the specified PLS-SEM model. The position and work-experience categories shown in Table 2 are simulation parameters used to create heterogeneous hypothetical profiles; they are not observed demographic characteristics and should not be interpreted as evidence about the distribution of employees in actual organizations. The sample size of 180 was selected for methodological demonstration and should not be interpreted as an empirical estimate of required organizational respondents.

3.3 Simulation Data Generation

The 180 observations were generated as synthetic Likert-scale data for methodological demonstration. First, five-point response categories (1 = strongly disagree to 5 = strongly agree) were defined for the 12 indicators in Table 1. Second, hypothetical position and work-experience categories were assigned according to the frequencies reported in Table 2; these frequencies were predetermined simulation parameters rather than observed respondent proportions. Third, latent scores for RT-DDDM, ODAC, and BP were generated and converted into five-point indicator responses. The simulation intentionally embedded positive associations among the constructs so that the proposed mediation structure could be demonstrated: RT-DDDM was specified to have a positive association with ODAC, ODAC a positive association with BP, and RT-DDDM a positive direct association with BP. Random variation was introduced at the indicator level to avoid identical responses across observations. The synthetic dataset was then imported into SmartPLS for the reported PLS-SEM analysis. Because the correlation structure was specified during generation, the resulting statistical relationships are partly conditional on the simulation assumptions and cannot be interpreted as independently observed effects. The original working file does not preserve the exact data-generation software, random seed, or generation script; these metadata should be archived with the synthetic dataset for full reproducibility rather than reconstructed retrospectively.

Table 1. Measurement of Variables

Variable	Code	Indicator
Real-Time Data-Driven Decision-Making (RT-DDDM)	RT1	Availability of real-time and up-to-date data Measurement basis: Szukits et al. (2023); Hjelle et al. (2024)
	RT2	Speed of obtaining relevant information Measurement basis: Hjelle et al. (2024); Kurpiela & Teuteberg (2023)
	RT3	Use of current data in decision-making Measurement basis: Szukits et al. (2023); Fattah (2024)
	RT4	Responsiveness to changes in business conditions Measurement basis: Hjelle et al. (2024)
Organizational Data Analytics Capability (ODAC)	OD1	Ability to manage organizational data Measurement basis: Gao & Sarwar (2022)
	OD2	Ability to integrate data from different sources Measurement basis: Gao & Sarwar (2022); Khan & Fatima (2024)
	OD3	Ability to analyze organizational data Measurement basis: Fattah (2024); Gao & Sarwar (2022)
	OD4	Ability to use analytical results to support decisions Measurement basis: Fattah (2024); Kurpiela & Teuteberg (2023)
Business Performance (BP)	BP1	Improvement in operational efficiency Measurement basis: Ansari & Ghasemaghaei (2023); Huang et al. (2022)
	BP2	Improvement in decision-making quality Measurement basis: Fattah (2024); Ansari & Ghasemaghaei (2023)
	BP3	Improvement in organizational productivity Measurement basis: Ansari & Ghasemaghaei (2023)
	BP4	Achievement of business objectives Measurement basis: Huang et al. (2022); Bhatti et al. (2022)

Measurement scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

3.4 Data Collection and Measurement

The simulated indicators use a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The indicators were not copied from a single established questionnaire. They were operationalized by

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the author from the construct definitions and informed by prior literature on data-driven decision-making, analytics capability, and organizational performance. RT-DDDM indicators were informed by literature emphasizing timely data use and decision-making (Szukits et al., 2023; Hjelle et al., 2024; Kurpiela & Teuteberg, 2023). ODAC indicators were informed by research on data analytics and analytics management capability (Gao & Sarwar, 2022; Fattah, 2024). Business Performance indicators were informed by studies linking analytics capability with organizational and firm performance (Ansari & Ghasemaghaei, 2023; Huang et al., 2022). Thus, the items should be described as author-developed indicators informed by the literature rather than as a validated scale directly adopted from one source. The 12 indicators were then used to generate the 180 simulated observations. Based on Table 1, each construct consists of four indicators that are used as the basis for measurement in the PLS-SEM analysis. All indicators were subsequently used to construct 180 simulated data observations to test validity, reliability, relationships among variables, and the mediating effect within the research model.

3.5 Measurement Model Evaluation

The measurement model evaluation was conducted to examine whether the author-developed indicators behave consistently within the simulated dataset. Outer loadings, Average Variance Extracted (AVE), Cronbach's Alpha, Composite Reliability, Fornell-Larcker Criterion, and HTMT were assessed using standard PLS-SEM criteria. These statistics demonstrate the internal behavior of the specified indicators in the simulated data; they do not establish measurement validity in a real organizational population. Accordingly, the reported validity and reliability values should be interpreted as simulation-based diagnostics rather than independent empirical validation of the scales.

3.6 Structural Model Evaluation

The structural model evaluation was conducted to examine the relationships specified in the simulation design. Path coefficients, R^2, f^2, and Q^2 were calculated in SmartPLS. R^2 and Q^2 are reported to illustrate how the simulated data behave under the embedded correlation structure. In particular, Q^2 should not be interpreted as evidence of real-world predictive capability, because the dataset is synthetic and its relationships were specified during generation. The structural statistics therefore describe the behavior of the simulated model conditional on the simulation assumptions.

3.7 Hypothesis Testing and Mediation Analysis

Hypothesis testing was conducted using the bootstrapping procedure in SmartPLS to evaluate whether the hypothesized relationships are reproduced within the simulated dataset. Decisions were based on the path coefficient, t-statistic, p-value, and confidence interval. Statistical significance in this context should not be interpreted as evidence that the same relationships exist in actual organizations. The four hypotheses test the direction and mediation structure specified during simulation: H1 RT-DDDM is positively associated with BP; H2 RT-DDDM is positively associated with ODAC; H3 ODAC is positively associated with BP; and H4 ODAC mediates the simulated relationship between RT-DDDM and BP.

3.8 Research Model

The research model was developed to examine the relationships among Real-Time Data-Driven Decision-Making (RT-DDDM), Organizational Data Analytics Capability (ODAC), and Business Performance (BP). RT-DDDM is positioned as the independent variable, ODAC as the mediating variable, and BP as the dependent variable. The model examines the direct effect of RT-DDDM on BP as well as its indirect effect through ODAC. The relationships among the variables and the research hypotheses are presented in Figure 1.

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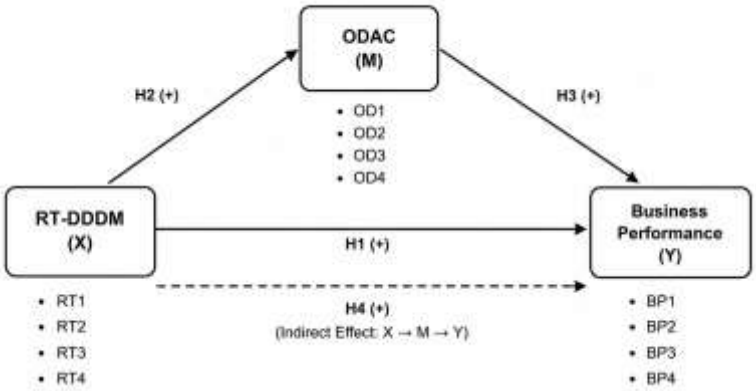


Figure 1. Research Model

Based on this model, the study examines whether the use of real-time data can directly improve *Business Performance* and whether *Organizational Data Analytics Capability* serves as a mechanism linking RT-DDDM to *Business Performance*. This model provides the basis for testing H1 through H4 using PLS-SEM.

3.9 Research Flow

The research flow was developed to illustrate the research stages systematically, from identifying the background and research problems to drawing conclusions. The research stages are presented in Figure 2.

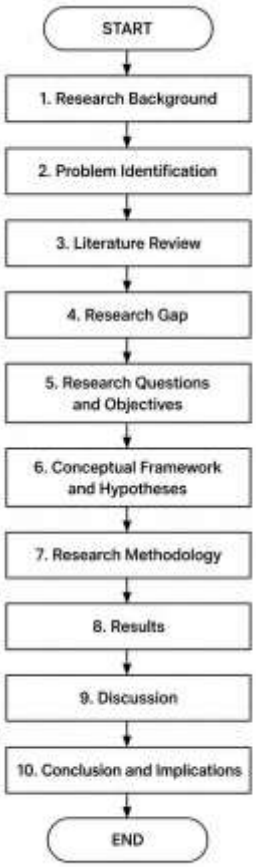


Figure 2. Research Flow

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The research flow indicates that the study begins with problem identification and a literature review, followed by the formulation of the research gap, research questions, conceptual framework, and hypotheses. Subsequently, the research is conducted using the established methodology, followed by the analysis of results, discussion, and the formulation of conclusions and research implications.

4. RESULT

4.1 Data Characteristics

This study uses 180 simulated data observations to test the research model using PLS-SEM. The simulated data were structured based on individual characteristics relevant to data utilization and decision-making processes within organizations, such as managers, supervisors, IT staff, data analysts, and employees. Work experience characteristics were also structured to represent variations in levels of experience in data utilization within the business environment.

Table 2. Simulation Parameters for Hypothetical Observation Profiles

Characteristic	Category	Frequency	Percentage
Position	Manager	36	20.0%
	Supervisor	42	23.3%
	IT Staff	38	21.1%
	Data Analyst	28	15.6%
	Other Staff	36	20.0%
Work Experience	< 3 years	38	21.1%
	3–5 years	57	31.7%
	6–10 years	51	28.3%
	> 10 years	34	18.9%
Total		**180**	**100%**

Table 2 reports simulation parameters rather than empirical respondent demographics. The position and work-experience frequencies were predetermined to create heterogeneous hypothetical profiles within the 180 observations. These categories were not obtained from questionnaires, and the percentages should therefore not be generalized to any organizational workforce. Their purpose is only to document the composition assumed during data generation.

4.2 Measurement Model Evaluation

The measurement model evaluation indicates that the simulated indicators meet the stated outer-loading, AVE, Cronbach's Alpha, and Composite Reliability thresholds. These results indicate consistent behavior within the synthetic dataset. They should not, however, be interpreted as independent empirical validation because both the observations and their relationships were generated synthetically.

Table 3. Measurement Model Evaluation

Construct	Indicator	Outer Loading	AVE	Cronbach's Alpha	Composite Reliability
RT-DDDM	RT1	0.821	0.681	0.844	0.895
	RT2	0.846			
	RT3	0.823			
	RT4	0.811			
ODAC	OD1	0.824	**0.690**	0.848	0.898
	OD2	0.852			
	OD3	0.831			
	OD4	0.814			
Business Performance	BP1	0.827	**0.699**	0.851	0.900
	BP2	0.856			
	BP3	0.839			
	BP4	0.821			

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Based on Table 3, the simulated indicators have outer loading values ranging from 0.811 to 0.856, while the AVE, Cronbach's Alpha, and Composite Reliability values exceed the stated thresholds. These results indicate that the specified indicators behave consistently within the simulated dataset. They should not, however, be interpreted as independent empirical validation because the observations and their relationships were generated synthetically.

4.3 Discriminant Validity

Discriminant validity was assessed to ensure that RT-DDDM, ODAC, and Business Performance represent empirically distinct constructs. The assessment was conducted using the Fornell-Larcker Criterion and HTMT. The results of the assessment are presented in Table 4.

Table 4. Discriminant Validity Results

Construct	RT-DDDM	ODAC	Business Performance	HTMT
RT-DDDM	**0.825**	0.706	0.692	—
ODAC	0.706	**0.831**	0.718	0.812
Business Performance	0.692	0.718	**0.836**	0.794
HTMT	—	0.812	0.826	—

Based on Table 4, the diagonal values in the Fornell-Larcker Criterion are higher than the reported correlations and the HTMT values are below 0.90. Thus, the constructs are statistically distinguishable within the simulated dataset. This result provides a diagnostic of the simulation model rather than evidence that the constructs have been empirically validated across actual organizations.

4.4 Structural Model Evaluation

After the measurement model met the validity and reliability criteria, the analysis proceeded with the evaluation of the *structural model*. The assessment was conducted using R^2, Q^2, and f^2 to evaluate the model's ability to explain the endogenous variables, its predictive relevance, and the magnitude of each relationship's contribution within the research model.

Table 5. Structural Model Evaluation

Construct / Relationship	R^2	Q^2	f^2
Organizational Data Analytics Capability	0.498	0.321	—
Business Performance	0.672	0.451	—
RT-DDDM → ODAC	—	—	0.986
RT-DDDM → Business Performance	—	—	0.231
ODAC → Business Performance	—	—	0.252

Within the simulated dataset, the R^2 value for ODAC is 0.498 and the R^2 value for Business Performance is 0.672. The reported Q^2 values are 0.321 and 0.451. These statistics describe the explanatory and cross-validated behavior produced by the simulation assumptions. In particular, the Q^2 values should not be presented as evidence of real-world predictive performance. The f^2 values likewise describe the relative contribution of the specified paths within this synthetic model.

4.5 Hypothesis Testing

Hypothesis testing was conducted using the bootstrapping procedure in SmartPLS to determine the significance of the direct relationships among the variables. The results of the direct effect analysis are presented in Table 6.

Table 6. Direct Effect and Hypothesis Testing

Hypothesis	Relationship	β	t-statistic	p-value	Result
H1	RT-DDDM → Business Performance	0.421	5.864	<0.001	Supported
H2	RT-DDDM → ODAC	0.706	13.842	<0.001	Supported
H3	ODAC → Business Performance	0.438	6.127	<0.001	Supported

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Based on Table 6, the simulated model produces positive and statistically significant paths for H1, H2, and H3. H1 has β = 0.421, H2 has β = 0.706, and H3 has β = 0.438, with p < 0.001. These coefficients indicate that the hypothesized relationships were reproduced in the simulated data. They should be interpreted as simulation-based results rather than empirical evidence that RT-DDDM improves Business Performance or that RT-DDDM and ODAC are causally related in actual organizations.

4.6 Mediation Analysis

Mediation analysis was conducted to determine whether Organizational Data Analytics Capability (ODAC) serves as a mechanism linking Real-Time Data-Driven Decision-Making (RT-DDDM) to Business Performance. The mediation effect was examined through the indirect effect using the bootstrapping procedure in SmartPLS. The results of the mediation analysis are presented in Table 7.

Table 7. Indirect Effect and Mediation Testing

Hypothesis	Mediation Path	Indirect Effect (β)	t-statistic	p-value	95% CI	Result
H4	RT-DDDM → ODAC → Business Performance	0.309	5.480	<0.001	0.201–0.422	Supported

Based on Table 7, the simulated indirect effect of RT-DDDM on Business Performance through ODAC is β = 0.309, with t = 5.480 and p < 0.001; the 95% confidence interval is 0.201–0.422. The interval does not include zero within the simulated bootstrap distribution. The direct effect also remains statistically significant in the simulated model, so the specified pattern is consistent with partial mediation. This result demonstrates the mediation pattern under the simulation assumptions; it does not establish the size or existence of the same mediation effect in actual organizations.

4.7 Summary of Hypothesis Testing

The overall hypothesis testing results indicate the relationships among Real-Time Data-Driven Decision-Making (RT-DDDM), Organizational Data Analytics Capability (ODAC), and Business Performance (BP). A summary of the results of the four hypotheses is presented in Table 8**.**

Table 8. Summary of Hypothesis Testing

Hypothesis	Statement	Result
H1	RT-DDDM positively affects Business Performance	**Supported**
H2	RT-DDDM positively affects ODAC	**Supported**
H3	ODAC positively affects Business Performance	**Supported**
H4	ODAC mediates the effect of RT-DDDM on Business Performance	**Supported**

Based on Table 8, all four hypotheses are supported by the simulated model. More precisely, the simulation reproduces the hypothesized positive direct relationships and the indirect mediation pathway. The results should therefore be described as evidence of the model's behavior under the specified simulation assumptions, not as evidence that the relationships are established in organizational populations.

5. DISCUSSION

5.1 The Effect of Real-Time Data-Driven Decision-Making on Business Performance

The simulated model produces a positive RT-DDDM–Business Performance path (β = 0.421). This pattern is consistent with prior literature indicating that data and analytics can support organizational performance (Ansari & Ghasemaghaei, 2023). However, the present result should not be interpreted as proof that real-time decision-making improves performance in actual organizations. The theoretical value of the model is that it treats timeliness as a distinct feature of data-driven decision-making. The temporal dimension may matter

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because current information can be more useful when business conditions change rapidly. Empirically, this proposition still requires testing with actual organizational data.

5.2 The Effect of Real-Time Data-Driven Decision-Making on Organizational Data Analytics Capability

The simulated model also produces a positive RT-DDDM–ODAC path (β = 0.706). Conceptually, this relationship reflects an organizational demand: when decision processes depend more heavily on current information, organizations need routines and capabilities for data integration, analysis, and interpretation. This differs from the definition of RT-DDDM itself. RT-DDDM concerns the use of current information in decisions, whereas ODAC concerns the underlying organizational capacity that makes such use possible. Prior work on data integration and data-driven decision-making provides support for this conceptual link (Sindarov et al., 2023). Because the relationship was embedded in the simulation, however, its magnitude should not be treated as an empirical estimate.

5.3 The Effect of Organizational Data Analytics Capability on Business Performance

The simulated ODAC–Business Performance path is positive (β = 0.438), which is consistent with prior studies linking analytics capability with firm performance (Aziz et al., 2023; Khalil et al., 2023). The mechanism proposed here is that analytics capability helps transform data into information that can be used for operational and managerial action. The simulated coefficient demonstrates how the model behaves when this relationship is specified; it does not independently confirm that stronger ODAC causes better performance in actual firms.

5.4 The Mediating Role of Organizational Data Analytics Capability

ODAC shows a significant indirect path in the simulated model, while the direct RT-DDDM–Business Performance path remains significant . This pattern is consistent with partial mediation and provides a useful theoretical interpretation: the model allows RT-DDDM to be related to performance through two routes (Garmaki et al., 2023; Karaboga et al., 2023). The first route is direct, representing the potential value of using current information to support timely responses. The second route operates through ODAC, representing the organizational capability needed to manage, integrate, and analyze information. The indirect pathway may be stronger in organizations with mature data infrastructure, analytical skills, data integration routines, and a data-oriented culture; it may be weaker where data quality, skills, or integration are limited. These conditional explanations are theoretical propositions for future empirical testing, not findings established by the current simulation.

6. CONCLUSION AND RECOMMENDATIONS

This study demonstrates, using 180 simulated observations, how a PLS-SEM mediation model can represent the proposed relationships among Real-Time Data-Driven Decision-Making (RT-DDDM), Organizational Data Analytics Capability (ODAC), and Business Performance. Under the specified simulation assumptions, the model produces positive direct relationships between RT-DDDM and Business Performance, RT-DDDM and ODAC, and ODAC and Business Performance, as well as a significant indirect pathway through ODAC. The direct effect remains significant, producing a partial-mediation pattern in the simulated data. These findings should be interpreted as simulation-based model outcomes rather than empirical evidence that RT-DDDM improves Business Performance in actual organizations. The conceptual distinction between RT-DDDM as a decision process and ODAC as an organizational capability provides the main theoretical contribution, while the transparent simulation design provides the methodological contribution.

The principal limitation is that all 180 observations are simulated. The simulation intentionally embeds positive associations among the constructs, so the resulting path coefficients, R^2, Q^2, validity statistics, and mediation effect are conditional on the generation assumptions. The study therefore cannot establish causal effects, population-level relationships, or real-world predictive performance. The demographic categories in

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Table 2 are also hypothetical simulation parameters rather than observed respondent characteristics. Future research should replicate the model using primary data from managers and employees in organizations that genuinely use real-time data-driven decision-making. Future studies should also test whether the indirect pathway through ODAC varies with data quality, data infrastructure, analytical skills, organizational culture, and digital capability.

Simulation reproducibility note. The simulation is defined by 180 hypothetical observations, five-point Likert indicators, predetermined profile frequencies in Table 2, and an intentionally positive latent association structure among RT-DDDM, ODAC, and Business Performance. The analysis was performed in SmartPLS after generation of the synthetic indicator-level dataset. The original working file does not preserve the exact data-generation software, random seed, or generation script. These metadata should be archived with the synthetic dataset for full reproducibility and should not be reconstructed retrospectively without evidence.

REFERENCES

Alaskar, T. (2024). The impact of organizational capabilities on business analytics use: the moderating role of environmental dynamism. *Information Systems and E-Business Management 2024*, 1–23. https://doi.org/10.1007/S10257-024-00670-6

Ansari, K., & Ghasemaghaei, M. (2023). Big Data Analytics Capability and Firm Performance: Meta-Analysis. *Journal of Computer Information Systems*, *63*(6), 1477–1494. https://doi.org/10.1080/08874417.2023.2170300

Ardyansyah, N. P., & Waluyo, R. A. (2026). Data Analytics for Enhancing the Efficiency of Digital Public Services. *Jurnal Ilmiah Manajemen, Ekonomi Dan Bisnis*, *5*(1), 48–55. https://doi.org/10.51903/124

Aziz, N. A., Long, F., & Wan Hussain, W. M. H. (2023). Examining the Effects of Big Data Analytics Capabilities on Firm Performance in the Malaysian Banking Sector. *International Journal of Financial Studies 2023, Vol. 11, Page 23*, *11*(1), 23. https://doi.org/10.3390/11010023

Bhatti, S. H., Ahmed, A., Ferraris, A., Hirwani Wan Hussain, W. M., & Wamba, S. F. (2022). Big data analytics capabilities and MSME innovation and performance: A double mediation model of digital platform and network capabilities. *Annals of Operations Research 2022 350:2*, *350*(2), 729–752. https://doi.org/10.1007/S10479-022-05002

Fakhira Syahputri, D., Putu, N. L., Raya, J., Unesa, K., Wetan, L., Surabaya, J., & Timur, I. (2025). Model of Accounting Digitalization Readiness in MSMEs: An Empirical Study of Technological Literacy, Internal Control, and Performance. *Jurnal Ilmiah Manajemen, Ekonomi Dan Bisnis*, *4*(1), 67–75. https://doi.org/10.51903/0958

Fattah, I. A. (2024). Decision making performance of business analytics capabilities: the role of big data literacy and analytics competency. *Business Process Management Journal*, *30*(6), 2096–2126. https://doi.org/10.1108/11-2023-0894

Gao, J., & Sarwar, Z. (2022). How do firms create business value and dynamic capabilities by leveraging big data analytics management capability? *Information Technology & Management*, *25*(3), 1. https://doi.org/10.1007/S10799-022-00380

Garmaki, M., Gharib, R. K., & Boughzala, I. (2023). Big data analytics capability and contribution to firm performance: the mediating effect of organizational learning on firm performance. *Journal of Enterprise Information Management*, *36*(5), 1161–1184. https://doi.org/10.1108/06-2021-0247

Guenther, P., Guenther, M., Ringle, C. M., Zaefarian, G., & Cartwright, S. (2023). Improving PLS-SEM use for business marketing research. *Industrial Marketing Management*, *111*, 127–142. https://doi.org/10.1016/2023.03.010

p-ISSN: 2803-1507 e-ISSN: 2803-1531

Gul, R., & Al-Faryan, M. A. S. (2023). From insights to impact: leveraging data analytics for data-driven decision-making and productivity in banking sector. *Humanities and Social Sciences Communications 2023 10:1*, *10*(1), 660-. https://doi.org/10.1057/s41599-023-02122

Guthrie, C. H., Fosso-Wamba, S., Queiroz, M. M., & Cai, H. (2025). The Impact of Artificial Intelligence Capabilities on Decision-Making Performance: *Journal of Global Information Management*, *33*(1). https://doi.org/10.4018/395344

Hjelle, S., Mikalef, P., Altwaijry, N., & Parida, V. (2024). Organizational decision making and analytics: An experimental study on dashboard visualizations. *Information & Management*, *61*(6), 104011. https://doi.org/10.1016/2024.104011

Huang, B., Song, J., Xie, Y., Li, Y., & He, F. (2022). The Effect of Big Data Analytics Capability on Competitive Performance: The Mediating Role of Resource Optimization and Resource Bricolage. *Frontiers in Psychology*, *13*, 882810. https://doi.org/10.3389/2022.882810

Jhantasana, C. (2023). Should A Rule of Thumb be used to Calculate PLS-SEM Sample Size. *Asia Social Issues*, *16*(5), e254658–e254658. https://doi.org/10.48048/2023.254658

Karaboga, T., Zehir, C., Tatoglu, E., Karaboga, H. A., & Bouguerra, A. (2023). Big data analytics management capability and firm performance: the mediating role of data-driven culture. *Review of Managerial Science*, *17*(8), 2655–2684. https://doi.org/10.1007/S11846-022-00596-8

Khalil, M. L., Aziz, N. A., Long, F., & Zhang, H. (2023). What factors affect firm performance in the hotel industry post-Covid-19 pandemic? Examining the impacts of big data analytics capability, organizational agility and innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *9*(2), 100081. https://doi.org/10.1016/2023.100081

Khan, M. U., & Fatima, I. (2024). The role of big data analytics capability in the telecommunication sector of Pakistan: the chain mediating effect of data integration capability and data-driven decision making. *Quality & Quantity 2024 59:1*, *59*(1), 51–85. https://doi.org/10.1007/S11135-024-01923-9

Kurpiela, S., & Teuteberg, F. (2023). Linking business analytics affordances to corporate strategic planning and decision making outcomes. *Information Systems and E-Business Management 2023 22:1*, *22*(1), 33–60. https://doi.org/10.1007/S10257-023-00661

Kusbianto, N., & Darmawan, A. (2024). Big data Analytics Capability Effect on Indonesia Firm Performance: The Mediating Role of Business Process Agility. *The International Journal of Accounting and Business Society*, *32*(2), 224–248. https://doi.org/10.21776/2024.32.2.874

Orero-Blat, M., Palacios-Marqués, D., Leal-Rodríguez, A. L., & Ferraris, A. (2024). Beyond digital transformation: a multi-mixed methods study on big data analytics capabilities and innovation in enhancing organizational performance. *Review of Managerial Science 2024 19:2*, *19*(2), 649–685. https://doi.org/10.1007/S11846-024-00768-8

Petra, D. N., Innayah, M. N., Purwidianti, W., & Utami, R. F. (2025). Driving MSME Success: Unveiling the Impact of Digital Literacy, Financial Literacy, Innovation, and Human Capital. *Kompak :Jurnal Ilmiah Komputerisasi Akuntansi* , *18*(1), 42–54. https://doi.org/10.51903/35

Ringle, C. M., Sarstedt, M., Sinkovics, N., & Sinkovics, R. R. (2023). A perspective on using partial least squares structural equation modelling in data articles. *Data in Brief*, *48*, 109074. https://doi.org/10.1016/2023.109074

Sindarov, A., Vafaei-Zadeh, A., Syafrizal, S., & Chanda, R. C. (2023). Big data analytical capability and firm performance: moderating effect of analytics capability business strategy alignment.

p-ISSN: 2809-1655 e-ISSN: 2809-1981

International Journal of Applied Decision Sciences, *16*(6), 663–685. https://doi.org/10.1504/2023.134188

Szukits, Á., Móricz, P., Móricz petermoricz, P., Szukits, Á., & Móricz, P. (2023). Towards data-driven decision making: the role of analytical culture and centralization efforts. *Review of Managerial Science 2023 18:10*, *18*(10), 2849–2887. https://doi.org/10.1007/S11846-023-00694-1

Xie, C., Xu, X., Gong, Y., & Xiong, J. (2022). Big Data Analytics Capability and Business Alignment for Organizational Agility: *Journal of Global Information Management*, *30*(1), 1–27. https://doi.org/10.4018/302915

Xu, M., & Lu, B. (2026). The data-driven decision-making, sustainable value creation, and international firm performance: Micro-level evidence based on AI language models. *PLOS ONE*, *21*(2), e0340731. https://doi.org/10.1371/0340731