Advancing Sustainable Performance through Islamic-Oriented Digital Transformation: The Mediating Role of Green Intellectual Capital in Indonesia

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Abstract

Islamic-oriented digital transformation (IODT) that incorporates sustainability values and ethical principles of Islamic technology can increase organizational sustainable performance (SP), especially for industry /manufacturing sector. This study seeks to investigate the impact of IODT on SP through green intellectual capital (GIC) as a mediating variable. Drawing upon the resource-based view (RBV) theory and knowledge-based view (KBV) theory, this contribution demonstrates how strategic capabilities and knowledge-based resources contribute to long-term sustainability. The quantitative approach in this study uses a survey method. Minimum sample size is calculated by G*Power 3.1, with a total of 155 respondents comprising managers and professionals who are in charge of operations, digital transformation, and sustainability practices in manufacturing or sustainable industrial companies based in Indonesia. Data were collected via structured questionnaires utilizing a Likert scale, and analyzed by means of Partial least squares structural equation modeling (PLS-SEM) using SmartPLS. The findings show that IODT has a positive and significant effect on GIC and leads to improving SP directly. The results revealed that GIC has a significant effect on SP and also mediates the relationship between digital transformation and sustainable performance. These discoveries emphasize the need to connect digital technology with sustainable knowledge assets. From a theoretical perspective, this study adds to the literature by extending the RBV and KBV within the context of Islamic-oriented digital transformation and sustainability. In practice, it offers empirical guidance for organizations that can utilize digital aptitude and green intellectual resources to reach sustainably balanced development in the Islamic context.

Keywords: Islamic-oriented digital transformation, Green intellectual capital, Sustainable Performance, Resource-based view.

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1. Introduction

The global manufacturing industry is confronted with a rising range of complex pressures related to digital disruption, sustainability, and business and supply chain expectations of responsible behavior. Approximately a quarter of energy-related carbon emissions and more than one-third of global energy consumption are derived from the industrial sector (Jagadeesh & Kumar, 2024; Jamwal et al., 2025). Manufacturing companies need to use technologies of artificial intelligence (AI), internet-of-things (IoT) and automation systems that will allow lower emissions or waste and high resource-use optimization (Favoretto et al., 2022; Ortiz-Rodriguez et al., 2023; Webster et al., 2023). The manufacturing sector continues to dominate the national economy in Indonesia, accounting for 19.07% of the total gross domestic product (GDP) in 2025 coupled with an annual growth rate of approximately 5.30% (BPS, 2026). Nonetheless, while undergoing intense global competition, Indonesia has encountered numerous challenges, including waste processing, uneven digital preparedness, and the pressure of shifting to environmental, social, and governance (ESG) standards (Iskandar et al., 2025; Prihandono et al., 2024; World Bank, 2025). However, while many companies have started their digitalization journey, such transformation tends to not result in the best sustainable outcome when the application of technology is not backed up with sufficient organizational capability, knowledge management, and ethical orientation (Chirumalla et al., 2025; C.-H. Wu et al., 2024). Hence, a new transformation model could bridge technology, ethics, and sustainability.

In the manufacturing sector, digital transformation is traditionally associated with technological integrations into business processes for increased efficiency and flexibility as well as changes in the value proposition model (Abdallah et al., 2021; Ren et al., 2023; C.-H. Wu et al., 2024). Digital transformation can enhance operational productivity, product innovation, supply chain resilience, and sustainability performance by improving energy efficiency and waste reduction (Cheng, 2024; Guo & Xu, 2021; Junge & Straube, 2020; H. Wang et al., 2023). Nonetheless, that achievement will critically depend not only on technology readiness but also on organizational ethical values, transparency, accountability, and social responsibility (Hariyani et al., 2025; Khani et al., 2025; Pullen et al., 2026). The principles of justice, trustworthiness, public transparency, and sustainable rights in Islamic sustainability management motivate organizations to consider technology as a means of creating shared value rather than focusing on economic efficiency (Hassan, 2024; Santoso et al., 2025; Srivastava et al., 2025). Islamic-oriented digital transformation (IODT) combines technological innovation capabilities with Islamic ethical values to assist appropriate and sustainable development (Akilah et al., 2026; Ghalih & Chang, 2026; Rosman & Marzuki, 2024). It frames digital transformation as a crucial strategic capability for manufacturing organizations to derive long-term competitive advantage.

The Resource-based view (RBV) states that a firm's sustainable competitive advantage depends on its valuable, rare, and imperfectly substitutable resources and capabilities that cohere firmly to the organization over time (Holz, 2025; Ren et al., 2023; Vafaei-Zadeh et al., 2024). IODT is a strategic capability that combines digital technology with ethical governance and sustainability orientation because it is difficult for competitors to replicate (Okorie et al., 2023; Tian et al., 2025). Conversely, Knowledge-based view (KBV) advocates placing knowledge as a significant asset of an organization driving the ability to innovate, learn, and respond to changes in the business environment (Bin-Nashwan & Li, 2025; Cuthbertson & Furseth, 2022; Hasanein & Al-Romeedy, 2026). As supported by this viewpoint, the potential of digital transformation will only be exploited when organizations can transmute information and technology into knowledge for sustainable reasoning (Cavalcanti dos Anjos et al., 2024; Salangka & Kameo, 2024; Zhang & Song, 2025). The link between digital transformation and sustainable performance necessitates the presence of knowledge-based internal mechanisms that serve as conduits for organizational value-creating processes (Haqqani et al., 2026; Mohamed et al., 2025). Therefore, the blending of RBV and KBV

serves as a solid theoretical basis for justifying the importance of Green Intellectual Capital (GIC) in this study model.

Green Intellectual Capital (GIC) refers to the accumulation of green knowledge assets reflected in employee competencies, organizational systems, and external relationships that support corporate sustainability (Peces Prieto et al., 2026; Rafique et al., 2025; C. H. Wang & Juo, 2021). GIC can enhance eco-friendly innovation and sustainably improve economic, social, and environmental performance (Asiaei et al., 2023; Li et al., 2023; Shahzad et al., 2025). In the context of digital transformation, technology merely provides data, connectivity, and automation, while its strategic benefits are only realized when organizations can effectively absorb and manage green knowledge (Cao & Xinwen, 2025; Daryono et al., 2024; Riaz et al., 2024). Thus, GIC acts as an internal mechanism that translates IODT into more adaptive and sustainability-oriented business practices (Chu et al., 2025; Dinh et al., 2026; Mohmand et al., 2026). Consequently, GIC is expected to mediate the influence of IODT on Sustainable Performance (SP).

Despite the increasing research on digital transformation and sustainability, most papers still position digital transformation in a conventional approach based on efficiency, innovation, and economic performance (Aghayari et al., 2023; Pierli et al., 2023; Plečko & Bradač Hojnik, 2024). Studies that connect digital transformation to Islamic ethical values, such as justice, trustworthiness, accountability, and the public good remain scarce – more so in manufacturing than in Islamic finance (Arifin & Kholis, 2025; Atif et al., 2021; Siswanti et al., 2024). There is little research on this, with many studies examining the mediating role of GIC in digital transformation and SP from different economic, social, and environmental perspectives (Daryono et al., 2024; Haqqani et al., 2026; Mohmand et al., 2026). Developing countries are generally more limited than developed countries due to differences in institutional characteristics and digital readiness (Nguyen et al., 2025; Pham et al., 2025; Srouji et al., 2025), and this limitation tends to be even worse for Indonesia as an example of developing country. This study attempts to fill this gap by investigating IODT, GIC, and SP in manufacturing companies in Indonesia. Based on the above discussion, this study addresses the following research questions:

RQ1 : How does Islamic-oriented digital transformation affect green intellectual capital?
RQ2 : How does Islamic-oriented digital transformation influence sustainable performance directly?
RQ3 : How does green intellectual capital affect sustainable performance?
RQ4 : How does green intellectual capital mediate the relationship between Islamic-oriented digital transformation and sustainable performance?

This study examines the effect of IODT on GIC and sustainable performance. This study also examines the mediating role of GIC in the relationship between Islamic-oriented digital transformation and sustainable performance. Theoretically, this study extends the application of resource-and knowledge-based views to the context of Islamic value-based digital transformation and corporate sustainability. The findings of this study are expected to provide guidance for manufacturing companies in Indonesia in integrating digital technology, green knowledge assets, and organizational ethical values to improve sustainable performance. From a policy perspective, the results of this study are expected to support the acceleration of a more inclusive, competitive, and sustainable national industrial transformation. This study emphasizes that the success of digital transformation depends not only on technological investment but also on an organization's ability to build and leverage GIC as a strategic resource. This article is structured as follows: Section 2 reviews the literature and formulates a hypothesis; Section 3 describes the research methodology; Section 4 presents the empirical results; Section 5 discusses the findings and their implications; and Section 6 concludes the study.

2. Literature Review

2.1. Theoretical Foundations; RBV and KBV

The Resource-based view (RBV) theory makes logical sense in that a firm can benefit from resources and capabilities which possess value, rarity, imitability, and ability to be organized that help the value of sustainable performance within the business entities (Rehman et al., 2025; Yu Ning, 2025). According to its context in this research, Islamic-oriented digital transformation (IODT) can be conceptualized as a strategic capacity including the incorporation of digital technology capable of effective governance conducted in an Islamic ethical manner with a sustainability orientation that robustly enhances a company's ability to adjust or adapt to changes occurring in business environment and customer preferences (Foss et al., 2023; Ren et al., 2023). Also, from the modern RBV perspective, it is important to know that the value-based digital capabilities (aligned with organizational values) can lead to dynamic advantage sources, through which organizations can achieve their purpose (Tian et al., 2025; Vafaei-Zadeh et al., 2024). This implies that Islamic value-based digital transformation can be utilized as a strategic assets to achieve sustainable performance, which is explained by RBV.

In this context, knowledge-based view (KBV) theory extends RBV by placing knowledge at the center of a company's capacity to sustainably create value and respond to change (Cuthbertson & Furseth, 2022; Stoian et al., 2024). GIC is the knowledge applicable to all employees, practices, and external relationships that underpin corporate sustainable development as reflected in an organization's green capabilities (Bin-Nashwan & Li, 2025; Mohmand et al., 2026). According to the KBV perspective, firms cannot maximize the gains from investments in digital technology unless they can absorb, integrate, and apply green knowledge into business processes and decision-making (Daryono et al., 2024; Haqqani et al., 2026). The resulting integration of RBV and KBV offers a holistic theoretical context for rationalizing the dual impact of IODT and GIC on sustainable performance enhancement.

2.2. Islamic-Oriented Digital Transformation

Islamic-oriented digital transformation (IODT) refers to intraband value tree-cut digital transformation initiatives that align the adoption of digital technology with Islamic ethical values, including justice, trustworthiness, transparency, social responsibility, and a commitment to sustainability across all organizational business processes (Arifin & Kholis, 2025; Atif et al., 2021). IODT, on the other hand, is not based around traditional elements of digital transformation, which is centered on productivity and efficiency gains, but instead sees technology as an enabler to generate economic value among decent social and environmental outcomes (Pierli et al., 2023; Plečko & Bradač Hojnik, 2024). According to some studies, digital transformation with the support of ethical governance can improve operational transparency, decision-making quality, stakeholder trust, and organizational resilience to changing business environments (Cheng, 2024; Siswanti et al., 2024; H. Wu et al., 2023). Conceptually, IODT can be actualized through the deployment of intelligent technologies, responsible information systems, participative digital cooperation, and procedural advances that promote sustainable usage footprint performance and accountability (Ren et al., 2023; C.-H. Wu et al., 2024). In theoretical terms, the resource-based view considers IODT to be a valuable and inimitable resource, whereas the knowledge-based view believes that an organization's capability of sustaining knowledge management and organizational learning as well as continuous institutionalization at the systemic level through culture is largely responsible for its effectiveness.

2.3. Sustainable Performance

Sustainable performance (SP) expects an organizational performance control system that balances the economic, social, and environmental effects to ensure a business's future sustainability. SP can be interpreted as manufacturing companies' capability to boost operational, social, and environmental performance through sustainable business strategies (Dinh et al., 2026;

Ullah et al., 2025; Wei & Zhao, 2025). Empirical research shows that companies with a stronger sustainability orientation have a better reputation (Shahzad et al., 2025), better stakeholder loyalty (Plečko & Bradač Hojnik, 2024), better resource efficiency, and more sustainable competitiveness (Li et al., 2023). Thus, in the manufacturing sector, SP can usually be estimated based on waste reduction and energy efficiency, eco-friendly product innovation, employee well-being improvement, and social contributions to the surrounding community (Jagadeesh & Kumar, 2024; Jamwal et al., 2025; Pham et al., 2025). Theoretically, a company's ability to mobilize strategic resources and the capabilities required for managing organizational knowledge determine sustainable performance. Therefore, IODT and GIC are the principal levers of a company's sustainable performance.

2.4. Green Intellectual Capital

Green intellectual capital (GIC) is an intangible environmental-based asset that consists of green knowledge, organizational systems, and connective networks that enable firms to generate economic, social, and environmental value (Bin-Nashwan & Li, 2025; Rehman et al., 2025). Thus, in this research context, GIC is pivotal as it assists manufacturing firms convert their IODT initiatives into real capabilities that enable operational efficiency, green innovation, and sustainable performance enhancement. GICs can facilitate several innovation processes (Daryono et al., 2024; Mansoor et al., 2021; Mohmand et al., 2026), increase resource efficiencies, streamline supply chain management, and enhance organizational knowledge utilization, thereby reducing waste and environmental impacts. In addition, during the corporate transformation process, GICs are enhancing their sociodemographic dimension for a responsible organizational culture, better employee competencies, and trust-building relationships with all stakeholders (Haqqani et al., 2026; Shehzad et al., 2022). The GIC comprises three dimensions: green human capital, green structural capital, and green relational capital. GIC works as a glue that conceptually links Islamic value-based digital capabilities with GIC.

2.5. Hypothesis Development

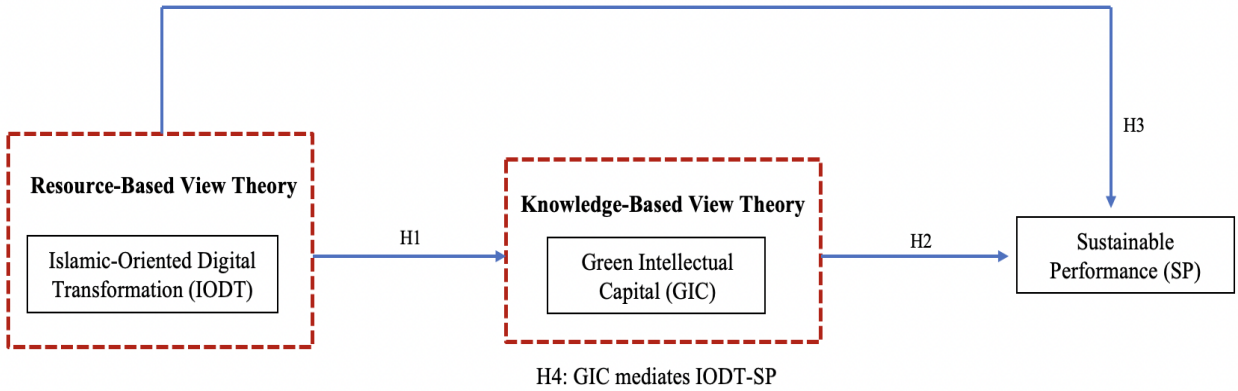


Fig. 1. Conceptual analytical framework and hypotheses

Source: Authors' elaboration (2026).

Islamic-Oriented Digital Transformation (IODT) is perceived as a strategic capability that combines digital technology with Islamic ethical values, such as transparency, justice and fairness, accountability, and sustainability. Such integration might reinforce organizational learning processes, knowledge exchange, and work systems that can facilitate green innovation. Digital transformation supports the creation of intellectual capital through data exploitation, cross-functional collaboration, and improved dynamic capabilities (Daryono et al., 2024; Pierli et al., 2023; Plečko & Bradač Hojnik, 2024). However, such effects vary in strength depending on the industry. Just as green knowledge asset formation is needed to respond to sustainability demand and IODT implementation is being proposed for manufacturing companies, our findings imply that

IODT implementation can make things happen more rapidly if the need for such green knowledge assets is encountered. From the above discussion, the following hypotheses can be formulated:
H1 : Islamic-oriented digital transformation (IODT) has a significant influence on green intellectual capital (GIC).

Green intellectual capital (GIC) is an intangible asset that encompasses employees' green competencies, sustainable organizational systems, and external relationships that support long-term value creation. GIC enables companies to improve resource efficiency, drive environmentally friendly innovation, and strengthen their social legitimacy in the eyes of stakeholders. Several studies have found that companies with high levels of GIC tend to have better economic, social, and environmental performance than companies that have not sufficiently developed GIC (Haqqani et al., 2026; Mohmand et al., 2026; Rehman et al., 2025). The ability to manage green knowledge is expected to be a key factor in improving the manufacturing sector's overall sustainable performance. Based on the above discussion, the following hypothesis is formulated:
H2 : Green intellectual capital (GIC) has a significant influence on sustainable performance (SP).

Islamic-Oriented Digital Transformation (IODT) not only seeks to leverage digital technology to improve operational efficiency but also leads organizational transformation around a culture of ethical values and social responsibility. By responsibly using technology, this method allows businesses to streamline business processes, increase transparency, and minimize environmental impact. According to previous studies, digital transformation has a positive relationship with productivity, innovation, and organizational sustainability (Aghayari et al., 2023; Pham et al., 2025; H. Wang et al., 2023), but various issues regarding resource preparedness and culture resistance often hinder its results. Thus, IODT is predicted to encourage manufacturing firms' sustainability performance in Indonesia. From the above discussion, the following hypothesis is proposed:
H3 : Islamic-oriented digital transformation (IODT) has a significant influence on sustainable performance (SP).

From an Islamic-oriented perspective, IODT brings digital infrastructure, process integration, data seamlessness, and operational efficiency to achieve corporate sustainability. Nevertheless, as previously discussed, the advantages of digital technology do not always guarantee an organization's sustainable performance because it lacks knowledge, internal systems, and collaborative networks in a position to achieve strategic use of that same technology. According to the KBV perspective, a company can fully leverage the value of digital transformation when it is able to transform technological resources into productive knowledge assets that are difficult for competitors to duplicate (Cuthbertson & Furseth, 2022; Stoian et al., 2024). Simultaneously, the resource-based view maintains that GIC is a strategic resource that can help solidify competitive advantage through employees' green aptitudes and skills, sustainable organizational systems, and external relations, which nourishes green innovation (Bin-Nashwan & Li, 2025; Mohmand et al., 2026; Rehman et al., 2025). This is consistent with previous studies that assert that intellectual capital can mediate the relationship between digital capabilities, organizational innovation, and corporate performance improvements (Daryono et al., 2024; Haqqani et al., 2026; Pham et al., 2025). Consequently, the extent of IODT implementation determines an organization's ability to develop GIC, ultimately leading to better sustainable performance in economic, social, and environmental dimensions. From this discussion, the following hypothesis is generated:
H4 : Green intellectual capital (GIC) mediates the relationship between Islamic-oriented digital transformation (IODT) and sustainable performance (SP).

3. Methods

3.1 Questionnaire Design

This study collected primary data using an online questionnaire developed in Google Forms. The questionnaire items were derived from the relevant literature (Table 1), reflecting the study's key variables. A seven-point Likert scale was adopted for each item. Initially prepared in English, the questionnaire was translated into Indonesian to increase clarity for local respondents.

Table 1. Measurement items.

Islamic-Oriented Digital Transformation (IODT) (Othman et al., 2024; Zainuddin et al., 2025; Zuhri & Pabbajah, 2026)
IODT-1: Our company actively integrates digital technologies to support environmentally sustainable operations.
IODT-2: We utilize advanced technologies (e.g., AI, IoT) to optimize resource efficiency and reduce environmental impact.
IODT-3: Digital systems in our company enable real-time monitoring of environmental and operational performance.
IODT-4: Our organization applies digital technologies to support circular economy practices such as waste reduction and resource reuse.
IODT-5: We use digital platforms to enhance transparency in sustainability reporting to regulators and stakeholders.
IODT-6: Our company collaborates with partners and suppliers through digital technologies to support sustainable supply chain practices.
IODT-7: We engage communities and stakeholders through digital platforms to support sustainability and CSR initiatives.
IODT-8: Digital technologies help build trust and strengthen communication with stakeholders regarding sustainability issues.
Sustainable Performance (SP) (Alathamneh & Al-Hawary, 2023; Pratiwi et al., 2025; Umar et al., 2024)
SP-1: Our company uses digital technologies to monitor and reduce environmental impacts in real time.
SP-2: We actively develop environmentally friendly products and processes to support sustainability.
SP-3: Our organizational culture encourages participation in environmental initiatives and green decision-making.
SP-4: We optimize the use of energy, water, and raw materials to reduce environmental impact.
SP-5: Employees experience improved well-being as part of the company's sustainability initiatives.
SP-6: Our company contributes to local community development through structured social programs.
SP-7: Stakeholders show a high level of trust in the company's environmental and social responsibility.
Green Intellectual Capital (GIC) (Bin-Nashwan & Li, 2025; Rehman et al., 2025; Shehzad et al., 2022)
GIC-1: Our employees possess green competencies that support the development of the company's environmental initiatives.
GIC-2: Our company has internal systems and processes designed to support sustainability practices.
GIC-3: We maintain strong relationships with external partners to enhance our environmental reputation.
GIC-4: Our sustainability-related knowledge is considered a strategic resource that is difficult for competitors to imitate.
GIC-5: We effectively integrate green knowledge into business strategies to respond to environmental challenges.

Note. IODT = Islamic-oriented digital transformation; SP = sustainable performance; GIC = green intellectual capital. Source: Items adapted from the studies cited for each construct.

3.2 Data Collection

The study population consists of companies in the manufacturing and sustainable industries in Indonesia, selected for their significant contribution to the national economy as well as the increasing adoption of digital transformation, sustainability practices, and business governance based on ethical values. The study respondents are permanent employees with at least three years of work experience who hold managerial or supervisory positions, including managers/supervisors, sustainability managers, operations managers, digital transformation/information technology managers, and members of corporate social responsibility and environmental, social, and governance teams. A screening question was included at the beginning of the questionnaire to minimize response bias: "Are you currently directly involved in decision-making, oversight, or the implementation of programs related to digital transformation, organizational knowledge management, or corporate sustainability?" Only respondents who answered "yes" were included in the study.

Data were collected over a period of three months (January to March 2026) using an online questionnaire with a five-point Likert-type scale. The research instrument was developed to measure Islamic-Oriented Digital Transformation, Green Intellectual Capital, and Sustainable Performance. The sample size was calculated using G*Power 3.1 software for two-tailed, with an alpha level of 0.05 and a statistical power of 0.95; hence, the minimum sample size required to be included in the study was determined as 155 respondents. The responses that met the research criteria were eventually used as the final sample in the analysis.

The data underwent several stages of inspection and cleaning before hypothesis testing, including the identification of incomplete data, inconsistent response patterns, and potential common method bias. Subsequently, the data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS software. The evaluation of the measurement model indicated that all constructs met the criteria for composite reliability, convergent validity, and discriminant validity, making the data suitable for testing the structural model and research hypotheses.

Table 2. Demographic Profile (n = 155)

Demographic	Option	Frequency	Percentage
Gender	Male	87	56.1%
	Female	68	43.9%
Position	Manager	42	27.1%
	Supervisor	39	25.2%
	Sustainability Manager	21	13.5%
	Operations Manager	24	15.5%
	Digital Transformation / Information Technology Manager	17	11.0%
	Corporate Social Responsibility / Environmental, Social, and Governance Team	12	7.7%
Education	Diploma	28	18.1%
	Bachelor	63	40.6%
	Master	54	34.8%
	Doctoral	10	6.5%
Length of Work Experience	Minimum 3 years	26	16.8%
	3–5 years	44	28.4%
	6–10 years	49	31.6%
	More than 10 years	36	23.2%

Region in Indonesia	Sumatra Island	31	20.0%
	Java Island	56	36.1%
	Kalimantan Island	22	14.2%
	Sulawesi Island	19	12.3%
	Papua Island	8	5.2%
	Lesser Sunda Islands	19	12.2%

Note. n = 155 respondents. Source: Primary data processed by the authors (2026).

4. Results and Discussion

4.1 Results

Table 3. Convergent validity and reliability

Variables	Indicators	Outer loading	α	CR	AVE
IODT	IODT – 1	0.648	0.897	0.922	0.551
	IODT – 2	0.712			
	IODT – 3	0.767			
	IODT – 4	0.767			
	IODT – 5	0.822			
	IODT – 6	0.844			
	IODT – 7	0.631			
	IODT – 8	0.720			
SP	SP – 1	0.853	0.949	0.959	0.765
	SP – 2	0.842			
	SP – 3	0.878			
	SP – 4	0.899			
	SP – 5	0.937			
	SP – 6	0.879			
	SP – 7	0.829			
GIC	GIC – 1	0.916	0.951	0.959	0.832
	GIC – 2	0.889			
	GIC – 3	0.911			
	GIC – 4	0.947			
	GIC – 5	0.906			

Note. α = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted. Thresholds: outer loading > 0.60; α and CR > 0.70; AVE > 0.50. Source: SmartPLS output, processed by the authors (2026).

Table 3 shows the convergent validity and reliability indicators, which show that outer loadings are greater than 0.60, Cronbach's alpha (α) values are above 0.70, composite reliability (CR) indices exceed 0.70, and average variance extracted (AVE) values are greater than the threshold value of >0.50. These thresholds indicate that the measurement items are internally consistent and sufficiently measure each construct (Hair et al., 2022; Sujanto et al., 2024). The model performs well, as indicated by the R^2 value of 0.193 for GIC, indicating that this model accounts for nearly 19.3% variation in GIC, and the adjusted R^2 value of 0.188 suggests that this model is stable (after considering the number of predictors used). Furthermore, the R^2 of 0.382 for SP indicates that 38.2% of the variability in SP is explained by model and adjusted R^2 of 0.378 indicates the consistency of the model with less potential for overfitting. The model's ability to

predict SP is moderate and weak–moderate with respect to GIC. However, such determination components are still considered adequate in research on organizational behavior and management, particularly with multidimensional latent constructs. A bootstrapping procedure with 10,000 subsamples was used to determine the significance of path coefficients, and bias-corrected confidence intervals were calculated at a 95% confidence level to ensure that the model-estimated relationships between variables were robust and reliable in terms of testing research hypotheses.

Table 4. Fornell–Larcker criterion

Variable	GIC	IODT	SP
GIC	0.914		
IODT	0.439	0.742	
SP	0.618	0.698	0.875

Note. Diagonal values are the square root of the AVE; off-diagonal values are inter-construct correlations. Source: SmartPLS output, processed by the authors (2026).

Based on Table 4, the square root of the AVE for each variable (for instance, IODT 0.742) is greater than its correlations with other constructs, such as GIC 0.439), which satisfies the Fornell and Larcker criterion. This outcome confirms adequate discriminant validity across all variables.

Table 5. Heterotrait-monotrait correlation ratio (HTMT)

Variable	HTMT
IODT <-> GIC	0.369
SP <-> GIC	0.622
SP <-> IODT	0.624

Note. HTMT = heterotrait–monotrait ratio of correlations; threshold < 0.90. Source: SmartPLS output, processed by the authors (2026).

Table 5 further shows that the HTMT ratios for each pair of constructs remain below 0.90, reinforcing the conclusion that the measurement model meets both convergent and discriminant validity requirements.

Table 6. Inner VIF

Variable	VIF
GIC → SP	1.000
IODT → GIC	1.000

Note. VIF = variance inflation factor; GIC → SP denotes the predictor GIC in the equation for SP. Source: SmartPLS output, processed by the authors (2026).

Prior to evaluating the structural model, the potential for multicollinearity was assessed using the inner variance inflation factor (VIF). All inner VIF values were under 4, signifying low multicollinearity. Therefore, the structural model can be considered to have a good fit and is suitable for further analysis.

Table 7. Hypothesis testing (direct effect)

	Path Coefficient	SD	*T* statistics	*P* values	Decision
IODT → GIC	0.439	0.049	9.057	0.000	H1: Positive and Significant

GIC → SP	0.618	0.050	12.355	0.000	H2: Positive and Significant
IODT → SP	0.272	0.047	5.768	0.000	H3: Positive and Significant

Note. SD = standard deviation. Significance assessed at $p < 0.05$ using bootstrapping with 10,000 subsamples. Source: SmartPLS output, processed by the authors (2026).

Based on the results of the hypothesis testing summarized in Table 7, all direct effects showed positive and significant coefficients (*p*-values < 0.05). Specifically, Islamic-Oriented Digital Transformation has a positive and significant effect on Green Intellectual Capital; Green Intellectual Capital has a positive and significant effect on Sustainable Performance; and Islamic-Oriented Digital Transformation also has a positive and significant direct effect on Sustainable Performance. These findings confirm the existence of a strong direct relationship between value-based digital transformation capabilities, an organization's green intellectual capital, and a company's sustainable performance.

Table 8. Hypothesis testing for the effect of mediation

	Path Coefficient	SD	*T* statistics	*P* values	Decision
IODT → GIC → SP	0.272	0.047	5.768	0.000	H4: Supported (Partially mediated)

Note. SD = standard deviation. Significance assessed at $p < 0.05$ using bootstrapping with 10,000 subsamples. Source: SmartPLS output, processed by the authors (2026).

Based on the results of the mediation analysis in Table 8, Green Intellectual Capital was found to partially mediate the relationship between Islamic-Oriented Digital Transformation and Sustainable Performance, as indicated by a path coefficient of 0.272, a *t*-statistic of 5.768, and a *p*-value of 0.000 ($p < 0.05$). These results indicate that Islamic-Oriented Digital Transformation not only has a direct effect on Sustainable Performance but also exerts an indirect influence through the enhancement of Green Intellectual Capital. These findings confirm that Green Intellectual Capital plays a strategic role as a bridging mechanism in transforming Islamic value-based digital capabilities into better sustainable performance. Companies capable of developing green competencies, sustainable organizational systems, and environmentally supportive external relationships will be more effective in maximizing the benefits of digital transformation for Sustainable Performance.

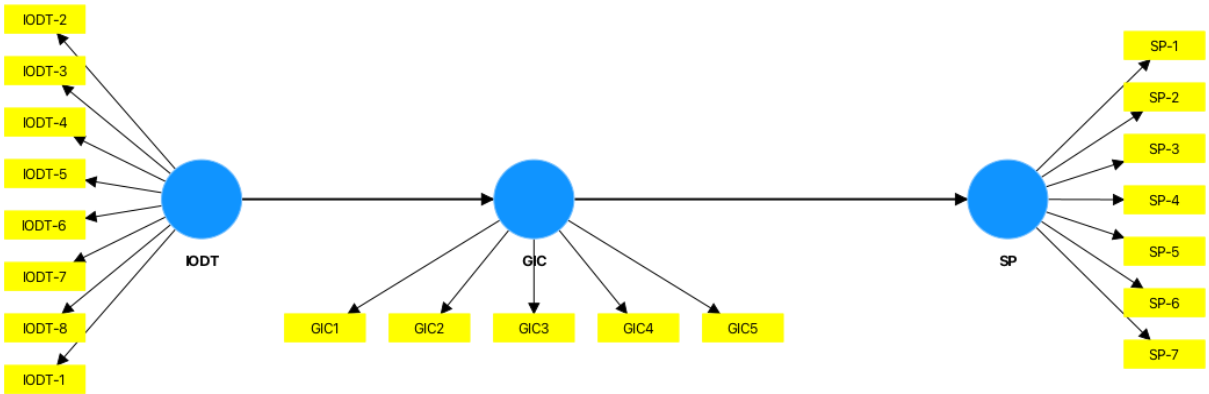


Fig. 2. Path coefficient
Source: SmartPLS output (2026).

4.2 Discussions

This study explores the direct and indirect relationship between IODT and sustainable performance (SP) using green intellectual capital (GIC) as a mediating variable. The results showed that green intellectual capital management can further bolster a positive relationship between digital transformation founded on Islamic values and sustainable firm performance. The results also confirm that IODT is a direct driver of improved SP, but stronger GIC thereby becomes a strategic pathway for delivering value in economic, social, and environmental contexts.

The positive and significant influence of IODT on GIC also aligns with findings from prior studies that reported that digital transformation enhances organizational knowledge application, creation, and storage through data integration, process automation, and improved cross-organizational collaboration (Pierli et al., 2023; Plečko & Bradač Hojnik, 2024; H. Wang et al., 2023). Moreover, the implementation of Islamic values, such as honesty, integrity, fairness, and social accountability, fosters an organizational culture that promotes learning, green innovation, and sustainable resource utilization (Arifin & Kholis, 2025; Atif et al., 2021; Siswanti et al., 2024). Specifically, targeted digitalization fosters employees' competencies on environmental issues to increase efficient internal systems and cultivate external relations with other partners focused on sustainability (Bin-Nashwan & Li, 2025; Mohmand et al., 2026; Rehman et al., 2025). Thus, apart from being an enabler of operational modernity, IODT is a major contributor to a company's identity-building process of schematic green knowledge assets. Such results further strengthen the argument that a digital transformation through an ecosystem approach leveraging ethical values and sustainability orientation will be more effective than driving isolated internal technology investments.

The positive and significant influence of GIC on SP is consistent with previous research showing that green knowledge assets can improve operational efficiency, drive eco-friendly innovation, and simultaneously strengthen the creation of economic, social, and environmental value (Bin-Nashwan & Li, 2025; Mohmand et al., 2026; Rehman et al., 2025). Companies with employees possessing sustainability-based competencies and strong external relationships tend to be better equipped to respond to market demands in the face of increasing regulatory pressures (Haqqani et al., 2026; Peces Prieto et al., 2026; Srouji et al., 2025). Furthermore, GIC helps organizations accelerate sustainable product development, improve energy and raw material efficiency, and strengthen the company's reputation in the eyes of stakeholders (Li et al., 2023; Shahzad et al., 2025; C. H. Wang & Juo, 2021). At the same time, an environmentally oriented organizational culture fosters higher employee loyalty and social legitimacy, thereby contributing to sustainable performance's social dimension. These findings reinforce the view that GIC investment is a critical factor for manufacturing companies to achieve stronger and more sustainable performance.

The positive and significant influence of IODT on SP is in line with previous literature indicating that smart technologies used in business activities lead to process efficiency, operational flexibility, and an environment for continuous innovation (Aghayari et al., 2023; Pierli et al., 2023; Plečko & Bradač Hojnik, 2024). Moreover, the incorporation of Islamic values such as transparency, justice, trustworthiness, and social responsibility in provisioning enhanced benefits to the digital transformation process by establishing more accountable governance and better business decisions directed toward the long term (Arifin & Kholis, 2025; Atif et al., 2021; Siswanti et al., 2024). In the manufacturing sector, IODT can help companies use energy and raw materials more effectively, minimize production waste, and improve product quality and customer service (Jagadeesh & Kumar, 2024; Jamwal et al., 2025; H. Wang et al., 2023). Additionally, ethical-value-oriented digitalization fosters stakeholder trust, corporate reputation, and more

sustainable social ties. These results further substantiate the idea that SP will be transformed more through values and sustainability than technology modernization.

Finally, the mediation analysis further elaborates the mechanism of how IODT affects SP. The findings suggest that GIC partially mediates the relationship between IODT and SP, indicating that IODT does not directly affect sustainable performance despite integrating a green knowledge asset within the firm. Transparency, trustworthiness, and social responsibility can be incorporated into digital technology implementation to improve employee competencies, reinforce organizational systems, and broaden cooperative mechanisms to deliver superior economic, social, and environmental performance (Bin-Nashwan & Li, 2025; Mohmand et al., 2026; Rehman et al., 2025). In other words, a strong GIC will maximize the positive impact of digital transformation by facilitating the translation of digital capabilities into sustained innovation and resource efficiency for additional value creation for their stakeholders (Daryono et al., 2024; Haqqani et al., 2026; C. H. Wang & Juo, 2021). These results further validate that GIC is an augmenting mechanism that adds to the observed positive direct effect of digital transformation on SP rather than a competing pathway because IODT continues to directly influence SP.

Combining digital transformation modernity with Islamic ethics guidance leads to operational efficiency, process transparency, and business responsibility. Thus, this study conceptualizes IODT as a strategic priority for managers to enhance sustainable performance. The integration of digital technology with the three key principles: trustworthiness, justice, and accountability enables high-performance sustainability to translate into improved work processes that are tailored through decision-making quality. However, digital transformation is not merely a technique - it's also a strategic and cultural transition of the corporation and its governance.

Research shows that IODT promotes GIC, implying that managers should always ensure that each penny spent on digitalization is used in constructing knowledge assets in the organization at a green label. Better digital systems should be accompanied by employee training, environmental knowledge documentation across the company, cross-departmental learning, and improved partnerships with suppliers or external parties. Without that backing, technology runs the risk of being limited to operational infrastructure with no lasting changes in organizational abilities. Therefore, managers must approach digitalization as a tool for developing green capabilities, systems, and knowledge networks.

The results indicate that GIC has a positive influence on sustainable performance, confirming signification of green intellectual capital investment in business strategy. Managers must enhance green human capital is by developing employee competencies, green structural capital via sustainable work processes and information systems, and green relational capital through collaborative relationships with customers, suppliers, regulators, and the community. With a well-managed interdependency of the above three, companies will have better chances of enhancing resource efficiency, sustainability innovation, reputation management, and social contributions.

This is evident in the partial mediation of GIC, where a higher success of digital transformation will occur if a high capacity for green knowledge is achieved. As such, managers need to not only buy into new technology but also help the organization build up its capacity to absorb, integrate, and apply knowledge created through that technology. Linking the pace of digital transformation with sustainability goals is achievable through knowledge sharing, digital learning platforms, sustainability dashboards, and program data-driven evaluations.

Based on the results of this study, the practical implications for manufacturing companies in Indonesia confirm that combining digital technology and organizational ethical value with green knowledge management you could create a sustainable competitive advantage. Those who combine the three will be in a stronger position to respond to sustainability-oriented demands for efficiency, regulatory pressures, market requirements, and industry competition.

5. Conclusions

Islamic-Oriented Digital Transformation (IODT) and green intellectual capital (GIC) play a crucial role in enhancing a company's sustainable performance (SP). Research findings indicate that IODT has a positive and significant impact on both GIC and SP, suggesting that digital transformation grounded in Islamic values can drive operational efficiency, more accountable governance, and the simultaneous creation of economic, social, and environmental value. GIC has also been shown to have a positive and significant influence on SP, thereby confirming that employees' green competencies, sustainable organizational systems, and productive external relationships are essential foundations for achieving SP. Furthermore, GIC partially mediates the relationship between IODT and SP, indicating that when green knowledge capacity is adequate, the benefits of digital transformation become stronger. Overall, this study provides evidence that an organization's ability to build and leverage green intellectual capital determines the success of digital transformation.

This study provides a deeper understanding of how the integration of the RBV and the KBV explains the relationship between digital transformation, knowledge assets, and sustainable performance. First, the findings indicate that when integrated with sustainability goals, value-oriented digital capabilities can serve as strategic resources that strengthen a company's competitiveness. Second, GIC functions as a crucial mechanism that translates digital resources into tangible organizational outcomes, thereby supporting the view that knowledge is a primary asset in corporate value creation. Third, the study's results confirm that manufacturing firms in developing countries can enhance their competitiveness through a combination of digital technology, ethical orientation, and integrated green knowledge management.

This study has several limitations. The study focuses only on manufacturing companies and sustainable industries in Indonesia. Thus, the results should be exercised with care when generalizing to other sectors. Furthermore, this is a cross-sectional study and does not reflect the longitudinal nature of the relationship between digital transformation and green intellectual capital development. Future studies may broaden the sample scope across countries and industrial sectors, use longitudinal data, and include more variables, such as institutional support, organizational culture, or green innovation, to obtain better insights into the drivers of sustainable performance.

6. CRediT Authorship Contribution Statement

Andi Amri and Wing-Keung Wong: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Project administration, Resources, Software, Validation, Visualization, Writing – original draft, and Writing – review & editing. **Ahmad Said and Agung Haryanto:** Conceptualization, Supervision, Validation, and Writing – review & editing.

7. Declaration of Competing Interest

The authors declare that they have no known competing financial interests, personal relationships, or other interests that could have influenced the work reported in this paper.

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9. Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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11. Ethical Approval

Ethical considerations were addressed throughout the research process. Participation in the study was voluntary, and informed consent was obtained from all respondents prior to their participation. Respondents were informed about the purpose of the study and their rights as participants, and their responses were treated confidentially.

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