

## **How Does Intellectual Capital Boost Sustainable Organisational Performance? The Mediating Role of Sustainable Performance Measurement Systems**

**Marjea Jannat Mohua<sup>1\*</sup>, Wan Fadzilah Wan Yusoff<sup>2</sup>, and Akter Afroza<sup>3</sup>**

<sup>1</sup>*School of Accounting and Finance, Asia Pacific University of Technology and Innovation, Jalan Teknologi 5, Taman Teknologi Malaysia, 57000 Kuala Lumpur, Malaysia*

<sup>2</sup>*School of Business, Universiti Tenaga Nasional (UNITEN), Jalan Kajang - Puchong, 43000 Kajang, Selangor, Malaysia*

<sup>3</sup>*Department of Business Administration, Chungnam National University, 99 Daehak-ro, Yuseong District, Daejeon, South Korea*

### **ABSTRACT**

The crucial role of intellectual capital (IC) and its broad implications are well documented in the academic literature, but it hasn't been entirely discovered yet how IC integrates into certain organisational control systems, including sustainable performance measurement systems (SPMS), when it comes to sustainability. To fill this gap, the purpose of this study is to investigate the linkages among IC dimensions, SPMS and sustainable organisational performance, from the ground of intellectual capital-based view approach. This study utilised structural equation modeling (SEM) particularly partial least squares (PLS) method to test the research framework and hypotheses based on data from 149 top-level decision-makers in Bangladesh's readymade garment (RMG) companies. The cross-sectional SEM results have shown mixed findings for both direct and indirect effects and hence offer new insights to address the research gap for this study. In addition, the contradictory findings highlight the relevance of the mediating role of SPMS in the link between IC and

sustainable organisational performance within the context of the study. However, this paper contributes new knowledge on the significance of the effective management operation (e.g., sustainable performance measurement systems) that enables explaining IC and its association with a sustainable organisational performance. Furthermore, this research also provides a practical contribution in the field of performance measurement systems through the inclusion of intellectual capital, which will enable top management to address stakeholder

### **ARTICLE INFO**

#### *Article history:*

Received: 20 January 2026

Accepted: 01 June 2026

Published: 30 June 2026

DOI: <https://doi.org/10.47836/pjssh.34.3.15>

#### *E-mail addresses:*

[marjea.jannat@apu.edu.my](mailto:marjea.jannat@apu.edu.my) (Marjea Jannat Mohua)

[wanfadzilah@putrabs.edu.my](mailto:wanfadzilah@putrabs.edu.my) (Wan Fadzilah Wan Yusoff)

[orpaafroza1992@gmail.com](mailto:orpaafroza1992@gmail.com) (Akter Afroza)

\* Corresponding author

expectations, taking into consideration environmental, social and economic issues in the current business landscape.

*Keywords:* Bangladesh, intellectual capital, intellectual capital-based view, sustainable performance measurement systems, sustainable organisational performance

---

## INTRODUCTION

The pragmatic determination of the sustainable performance of firms has recently emerged as a challenging endeavour for organisation's survival and development (Yusoff et al., 2019). Business sustainability performance is synonymous with comprehensive conservation practices, as it is essential for sectors to adopt sustainable business practices to fulfil the Sustainable Development Goals (SDG) agenda. In addition, the implementation of embedding sustainability in businesses has two main drivers: to meet stakeholder expectations (Gross-Gołacka et al., 2020) and also to avoid the environmental degradation caused by making business.

Recently, Grazier (2025) highlights in the sustainability report that it is significant for the organisations to perform a materiality evaluation process, analysing the competitors in the market, accumulating consistent data, and monitoring the performance for maintaining an effective environmental and social performance. Specifically, World Bank Group (2019) analysis indicates that around 17% to 20% of water pollution is attributable to industrial activities in the clothing and ready-made garment sector, with 72 hazardous compounds resulting from the dyeing and treatment processes. Likewise, McFall-Johnsen (2020)

highlights that 10% of human carbon emissions are generated by the fashion industry, 85 percent of textiles end up in landfills every year, microplastics make up 31% of oceanic plastic pollution, and it is said that industrial water pollution contributes roughly about twenty per cent (20%). The McKinsey and Company study by Berg et al. (2023) reported that the clothing industry contributes to 10% of the world's greenhouse gases, highlighting its environmental cost. As international organisations begin to ring the alarm about the dangers to financial stability posed by climate change and the lack of management effort in the shift to low-carbon systems (Aggarwal et al., 2025). Consequently, it is the fundamental obligation of enterprises to adhere to rules and regulations to have a sustainable relationship with stakeholders (Omer & Noguchi, 2020). If this issue remains unresolved, numerous companies may forfeit their contracts due to non-compliance with the SDG.

Bangladesh's RMG industry has turned out to be one of the leading exports for the country in the past four decades. This sector has improved significantly and emerged as one of the largest garment producers in the world (BGMEA, 2022). Although the readymade garment (RMG) sector in Bangladesh is one of the best sourcing

locations for US buyers, and worldwide after China (Berg et al., 2021), but also still serves as the major cause of environmental and social pollution, whose contribution to poisonous chemicals, waste emission, air contamination and water effluent puts an immediate crisis into ecological factors (DataBD.CO, 2019). However, Bangladesh must attain the status of a middle-income country; failing to do so may result in the loss of EU economic relations due to non-compliance with international standards. As such, the essence of sustainability includes a holistic view that sustainable business performance should be undertaken in totality, which raises the question: "What potential strategies can be implemented to achieve sustainable organisational performance in internal business operations?"

With this aim, organisations are seeking effective strategies for implementing business sustainability. In a knowledge-based era, sustainable organisational performance is increasingly dependent on intangible resources as the paradigm shifts from the industrial to the information-based economy (Edvinsson & Malone, 1997). A significant stream of literature has attempted to indicate how intellectual capital as knowledge resources can influence sustainability or sustainable business performance and revealed positive findings between the associated variables, e.g., intellectual capital and sustainability (Gross-Gołacka et al., 2021) sustainable financial performance (Muchran, 2020); financial performance and ecological performance (Khan et al., 2021); intellectual

capital related to green panorama, and business sustainability (Sabir et al., 2020; Suki et al., 2023); intellectual capital using the integrated intellectual capital model for organisational performance (Shaari et al., 2018); sustainable competitive advantage (Astuti et al., 2023) and sustainability initiatives (Phonthanukitithaworn et al., 2023); intellectual capital incorporating social capital with the standard three basic dimensions (human capital, structural capital and relational capital) (Asiaei & Jusoh, 2017). Despite these constructive positive outcomes, there are a plethora of studies that demonstrate the diverse level of hindrances and challenges as negative findings (Gross-Gołacka et al., 2020; Hermawan et al., 2020; Noor & Nawangsari, 2021) in the ground of intellectual capital and business sustainability, specifically, green intellectual capital, and business sustainability (Yusoff et al., 2019), as well as organisational performance (Asiaei & Jusoh, 2015). These contradictory findings have prompted a call for further research into the management that may account for variance in the connection between intellectual capital and sustainable organisational performance. Specifically, the novel course of action for the current study combines multifaceted views of intellectual capital (Human capital, structural capital, relational capital, and social capital) with a multidimensional perspective of sustainable organisational performance (social, environmental, and economic). Conversely, there is significantly less prior evidence supporting the concept of social capital (Asiaei et al., 2018).

Interestingly, the concept of intellectual capital and sustainability is still growing (Dumay & Garanina, 2013), but more critical investigation is important (Massaro et al., 2018). In addition, sustainability must be integrated to be sustainable in the digital dynamic era, where intellectual capital is one of the most important capitals (CIMA, 2020). Pangidoan & Nawangsari (2022) mentioned that organisational sustainability as a subject of business practice is less critically interested in compliance because implying the ecological conceptions into the management practice grounded on sustainability represents a very challenging task, and is an area for further investigation that has not been extensively explored by previous researchers (Mio et al., 2022). The prior literature has already significantly contributed to multiple mediating construct like organisational learning capability (Sabir et al., 2020); innovation (Aljuboori et al., 2022; Obeidat et al., 2021); technological innovation (Xu et al., 2019); technology usage (Torre et al., 2020), and environmental management practice (Alam et al., 2021) in the specific area of research. This study has selected sustainable performance assessment systems that are frequently neglected yet may act as a link between intellectual capital and sustainable organisational performance. Therefore, the strategic importance of sustainable performance should be reflected in operational implementation efforts, and assessment, monitoring, and improvements must become indispensable (Maas et al., 2016). Although external sustainability reporting patterns are well understood, less

is known about the development of performance measurement systems for sustainability-related information (Gond et al., 2012; Maas et al., 2016), thus underpinning a current research gap in the basis of this study. Specifically, sustainability-based management control systems enable senior management to execute sustainability projects by integrating fundamental sustainability principles, including assessing performance outcomes and mitigating strategic risks linked to sustainability initiatives (Asiaei et al., 2026). This strand of research demonstrates that intellectual capital, as well as sustainable organisational performance must be consistent with the organisation's processes and systems (Lasiyono, 2019). Moreover, the notions of intellectual capital and sustainable performance measurement systems for sustainability performance have garnered separate consideration in numerous studies, while integrating all variables into a cohesive framework is both unique and distinctive. Hence, the present study aims to examine the management of intellectual capital resources using effective sustainability-oriented performance measurement systems to optimise sustainable business performance.

The theory of the intellectual capital-based view (ICBV), which posits the relationships regarding intellectual capital and its components in regard to sustainable organisational performance, serves as the foundational structure of this research. A mid-range approach was proposed by Reed et al. (2006), known

as the ICBV theory, that considers the constraints of the resource-based view (RBV). However, the relationship between the natural environment and the firm is mostly ignored in the RBV perspective (Harts, 1995) by presenting a generic form of intangible resources, while knowledge is the ultimate source of intellectual capital, emphasised in ICBV theory (Reed et al., 2006). Furthermore, ICBV suggests a novel "knowledge-intensive" or "intellectual-based" framework to achieve competitive advantage for surviving in the dynamic business environment (Khalique et al., 2018; Khalique & De Pablos, 2015; Martín-de-Castro et al., 2011), but the multidimensional view of intellectual capital is less focused in previous literature (Asiaei & Jusoh, 2015). Therefore, this study has incorporated the multifaceted concept of intellectual capital by including social capital, using ICBV, because RBV theory is highly descriptive and static. At the same time, ICBV is dynamic, representing exceptional features that distinguish it from physical resources and help to create competitive advantages and ensure sustainability (Curado, 2006). Additionally, the ICBV framework is more conducive to hypothesis generation and empirical testing than the RBV framework. Besides, ICBV focuses exclusively on the knowledge generated and maintained within a company's three essential assets: its people, social and interpersonal connections, and information technology systems and procedures (Reed et al., 2006). Consequently, these assumptions have fewer discussion points in preceding studies, which highlight substantial theoretical gaps

in the current study. To the researcher's knowledge, this is one of the unique study integrating multifaceted views of intellectual capital through sustainable performance measurement systems in achieving sustainable organisational performance. In the final analysis, this study extends to fill the gaps in two aspects. Explicitly, this study aims:

1. To examine the relationship between intellectual capital and sustainable organisational performance.
2. To investigate the mediating role of sustainable performance measurement systems in the relationship between intellectual capital and sustainable organisational performance.

The rest of this paper is structured as follows: Section 2 reviews existing literature in intellectual capital and sustainable performance measurement systems for achieving sustainable organisational performance through the lens of the intellectual capital-based view (ICBV) and contingency theory to formulate a series of hypotheses. Afterwards, the methodology of research for this study is presented in Section 3, with the findings consequently reported in Section 4. Finally, Section 5 indicates the main findings of the paper, implications of theory and practice for research, study limitations and future avenues.

## LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

From the theoretical perspective of the ICBV approach, knowledge-based assets are the primary factors that can effectively

improve performance (Reed et al., 2006). Sustainable organisational performance focuses on beyond revenue generation, which integrates social, environmental, and economic performance, known as the triple bottom line approach (TBL) (Elkington, 1998; Saba et al., 2023). The present study also emphasises the multidimensional characteristics of intellectual capital, which comprises human, structural, relational and social capital (Asiaei & Jusoh, 2017; Subramaniam & Youndt, 2005).

### **Intellectual Capital and Sustainable Organisational Performance**

Nevertheless, the plethora of research examining the connection between intellectual capital and sustainable or organisational performance still leaves substantial gaps in this specific area across different research settings. For instance, Gross-Golacka et al. (2020) scrutinised the relationships between intellectual capital and its components and business sustainability, taking managers' perceptions in the context of SMEs in Poland into account. The outcomes indicate that human capital is more influential than other components (relational and structural capital). More specifically, Muchran (2020) has examined Indonesian pharmaceutical firms, and the findings have shown a positive connection between intellectual capital and the dimensions (human capital, relational capital, and structural capital) on sustainable economic performance. Prioritising relational capital, Roxus & Chadee (2016) examined the significance of a knowledge-based view

for environmental sustainability, as demonstrated by 241 manufacturing SMEs in the Philippines and showed that the knowledge-based view is important for long-term business performance in both general and strategic management settings. Furthermore, Yusoff et al. (2019) empirically investigated Malaysia's manufacturing SMEs. The study has found that green structural capital and green relational capital can positively influence business sustainability, whereas green human capital is insignificant. According to Noor & Nawangsari (2021), there appears to be a lack of consistent initiative to improve employees' structural and relational capital within the firm's organisational structure to support the firm's sustainability, while human capital is a significant potential asset in regional listed companies in Jakarta, Indonesia. Contrarily, Najib & Nawangsari (2021) found that human capital is insignificant for organisational sustainability, whereas structural and relational capital are significant in Indonesian maritime services. IC functions as a knowledge base resource for maximising sustainability performance, which is still obscure and necessitates further analysis (Asiaei et al., 2023; Li et al., 2024). Existing scholarly work expressed that intellectual capital has a positive and significant impact on the business performance of SMEs (Xu & Li, 2020), but sustainable business performance is still unaddressed (Yusliza et al., 2020).

Bearing the above issues in mind, prior researchers have reported contradictory findings, prompting further investigation

of the study. This rationale encourages the following hypotheses:

Hypothesis 1: There is a significant relationship between intellectual capital and sustainable organisational performance

H1(a): There is a significant relationship between human capital and sustainable organisational performance

H1(b): There is a significant relationship between structural capital and sustainable organisational performance

H1(c): There is a significant relationship between relational capital and sustainable organisational performance

H1(d): There is a significant relationship between social capital and sustainable organisational performance.

### **Mediating Role of Sustainable Performance Measurement Systems in the Relationship between Intellectual Capital and Sustainable Organisational Performance**

Both researchers and practitioners unanimously accept that the implementation of sustainability issues in business operations can assist in environmental preservation and social progress (Wijethilake, 2017). Numerous studies have yielded inconclusive results regarding the relationship between intellectual capital and sustainable firm performance (Gross-Gołacka et al., 2020; Najib & Nawangsari, 2021; Noor & Nawangsari, 2021). These results might

indicate the importance of mediating mechanisms, such as sustainability-based performance measurement systems, in promoting intellectual capital and sustainable organisational performance (Asiaei et al., 2021).

However, the limited number of empirical studies and the conflicting research findings do not adequately elucidate why sustainable performance measuring systems enhance sustainable organisational performance (Asiaei et al., 2018; Asiaei et al., 2021; Thanh & Cong, 2024). For instance, Asiaei et al. (2018) indicated that performance measurement systems as a mediator including social and environmental factors between IC and organisational performance, play a significant role in evaluating the business performances. This research has argued that the presence of mediation effects can influence the outcome of intellectual capital and firm performance. In another study, Thanh & Cong (2024) evaluated green performance measurement systems as an intermediary to analyse the conceptual relationship of green intellectual capital and environmental performance. The findings indicated that the implementation of green performance measurement systems has beneficial effects on cooperation within the industry sector, where the purpose of social advantages is attained. However, Asiaei et al. (2021) investigated whether performance measurement systems are significant in implementing intellectual capital as knowledge-based assets to improve performance. Unexpectedly,

the study suggests that performance measurement systems do not play an intervening role in facilitating intellectual capital for corporate-level performance in listed Iranian companies. Although ample research has been conducted on environmental disclosure and reporting, considerably less is understood on the internal organisational systems and competencies (Asiaei et al., 2023). This dilemma motivates the development of sustainable performance measurement systems that elucidate the role of intellectual capital in achieving sustainable organisational performance.

This is how the notion of the “fit as mediation” approach has come to the point in the current phenomena. Traditionally, Venkatraman (1989) conceptualised the "fit as mediation" approach as the relationship between antecedents (strategy) and a subsequent outcome; the mediation perspective requires the presence of a central intervening mechanism (such as an organisation's structure). Similarly, the “fit as mediation” approach from contingency theory posited that knowledge-based resources as strategic ones might affect the organisational structure as performance measurement systems to achieve a superior firm performance such as sustainable performance (Asiaei & Jusoh, 2017; Drazin & de Ven, 1985). A sustainable performance measurement system helps to manage strategic resources (Figge et al., 2002). Based on these premises, knowledge-based attributes can influence sustainable

organisational performance considering appropriate sustainable performance measurement systems, and hence, the hypotheses can be proposed:

Hypothesis 2: Sustainable performance measurement systems mediate the relationship between intellectual capital and sustainable organisational performance.

H2(a): Sustainable performance measurement systems mediate the relationship between human capital and sustainable organisational performance.

H2(b): Sustainable performance measurement systems mediate the relationship between structural capital and sustainable organisational performance.

H2(c): Sustainable performance measurement systems mediate the relationship between relational capital and sustainable organisational performance.

H2(d): Sustainable performance measurement systems mediate the relationship between social capital and sustainable organisational performance.

## METHODS

### Study Context

The Bangladesh Garment Manufacturers and Exporters Association (BGMEA), one of the most influential trade organisations for ready-made apparel manufacturers

and exporters in Bangladesh, provided 4500 registered companies as the population of interest for this study. The primary objective of this study is to ensure the long-term sustainability of the business. Hence, Bangladesh's RMG sector is the pioneer of the global environmental initiatives, with 67 green structures and 13 factories receiving LEED Platinum Certification in recognition of exemplary sustainability practices. Therefore, this research centres on LEED-certified RMG companies as its population (Sarkar et al., 2020). Besides, RMG ecosystems can enhance workers' rights, workplace safety, and ethics to meet stakeholder demands in this sustainable development era (Textile Today, 2023). Consequently, it is essential to establish effective green management control systems to mitigate the environmental impact of business activities. Bangladeshi RMG companies have a deficiency in expertise concerning the application of sustainability-based management control systems (Islam & Rahman, 2022). As sustainability is an emerging concept, this study selected 140 LEED-based RMG companies for data collection as certified by the U.S. Green Building Council (USGBC), prioritising the triumph of achievement of sustainability disclosure and practices.

### Research Design

In this study, positivist research philosophy has been adopted to explore the mediating

role of sustainable performance measurement systems in the relationship between intellectual capital and sustainable organisational performance. The unit of analysis in this study is the organisation, specifically its key decision-makers involved in internal operations and sustainability, including Chief Executive Officers, Chief Financial Officers, and Deputy General Manager. However, there can be a limited sample size when the targeted participants are at the organisational level or decision makers of the company (Memon et al., 2023). Therefore, the number of structured questionnaires is boosted to 280 (140\*2) and distributed to the respective RMG companies. With this view, the stratified sampling technique is implied, which is the most efficient in probability sampling (Sekaran & Bougie, 2020). Ultimately, of the 280 distributed questionnaires, 149 replies were deemed genuine and suitable for subsequent data analysis, resulting in a response rate of 53.21%. A survey's response rate must exceed 30% to meet the threshold of acceptability (Sekaran & Bougie, 2016). A 50% or higher response rate is considered excellent (Chung, 2021).

### Research Framework

Based on the preceding literature review, this study has developed a research framework that provides a novel research agenda to highlight research gaps and contribute to existing research, as presented in Figure 1.

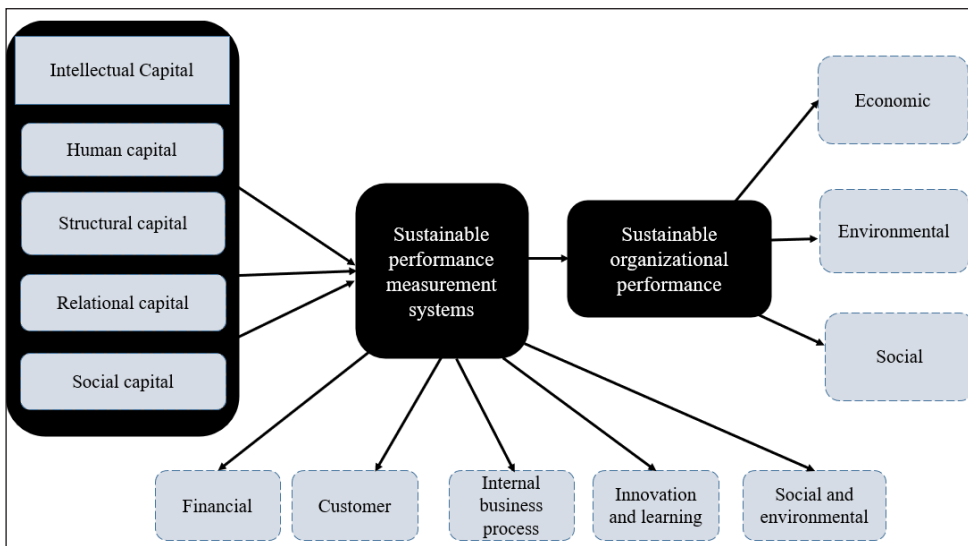


Figure 1. Research framework

### Operationalisation of Key Variables

The measurement for the implied variables for sustainable organisational performance as economic performance (Khan et al., 2021); Social and environmental performance (Yusoff et al., 2019); Intellectual capital for human capital (Asiaei et al., 2018) structural capital (Phonthanukitithaworn et al., 2023); relational and social capital (Asiaei et al., 2021) and sustainable performance measurement systems (Asiaei et al., 2021) supported by the relevant literature in the context of the study. Besides, the study utilised a seven-point Likert scale from “Not at all to “very great extent” for sustainable organisational performance and sustainable performance measurement systems and “strongly disagree” to “strongly agree” for intellectual capital, as attached in the appendix section.

### Goodness of Data

A non-response bias analysis is essential because this test strengthens the validity of the survey (Sukri & Yusoff, 2021). Thus, the independent sample T-test has been conducted in two groups. The findings have shown that the mean values of the variables for both groups of participants were relatively similar, as presented in Table 1. Following, Lindner and Wingenbach (2002) recommendation, since the research achieved 56.07% response rate, it can be considered that non-response bias was not a major concern.

The presence of missing values in a survey indicates that respondents were reluctant to provide certain information in the questionnaire (Umar et al., 2015). The findings of the SPSS analysis for missing values disclosed that only 1.42% were identified in the data set. According to

Table 1  
Independent sample *T* test

		Group Statistics			
		N	Mean	Std. Deviation	Std. Error Mean
HC	Early respondents	50	5.9500	0.74128	0.10483
	Late respondents	50	5.6920	0.64928	0.09182
SC	Early respondents	50	6.1360	0.69686	0.09855
	Late respondents	50	5.4840	0.75061	0.10615
RC	Early respondents	50	6.1480	0.55374	0.07831
	Late respondents	50	5.7190	0.62457	0.08833
SOC	Early respondents	50	5.8720	0.89603	0.12672
	Late respondents	50	5.4530	0.61382	0.08681
SPMS	Early respondents	50	5.3773	0.49590	0.07013
	Late respondents	50	5.1067	0.58709	0.08303
SOP	Early respondents	50	5.5520	0.58987	0.08342
	Late respondents	50	5.1800	0.56892	0.08046

*Note.* HC-Human capital; SC-Structural capital; RC-Relational capital; SOC-Social capital; SPMS-Sustainable performance measurement systems; SOP-Sustainable organisational performance

Acuña & Rodríguez (2004) if a rate falls below 1%, it is considered acceptable. To facilitate further analysis in the Smart-PLS, the values of replacement data were processed using SPSS 23.0 utilising the linear interpolation method. This study conducted the "Mahalanobis distance statistical analysis" technique for outlier detection (Ghorbani, 2019). Therefore, six predictors were identified in this study, it is important to note that the threshold chi-square value is 22.458 at a significance level of  $p = 0.001$ , and no multivariate outliers are identified in the dataset.

As a methodological technique, the study has used two statistical software programs: SPSS 23.0 for descriptive statistics and PLS-SEM 4.0 to establish measurement and structural models. SPSS was used to evaluate the demographic attributes of the participants, encompassing the organisation's age, type of business, number of employees, job title, and work experience as presented in Table 2. After finalising the research's basic characteristics, PLS-SEM was used to establish measurement and structural models to test hypotheses in line with the study's objective. Researchers often justify the use of PLS-SEM due to the

small sample size (Hair et al., 2019). The PLS-SEM method is more attractive to numerous researchers than the CB-SEM technique because of its ability to determine sophisticated models containing multiple constructs, measurement variables, and structured routes without enforcing any logistical presumptions on the information (Hair et al., 2020). This study aligns with (Asiaei et al., 2021) by offering

reflective models that initially assess the reliability and validity of the constructs, followed by a structural model to evaluate the hypotheses (Hair et al., 2019). Furthermore, prior studies in sustainability, performance measurement systems, and RMG companies have employed analogous constructs reflectively, so affirming the appropriateness of the reflective paradigm for this research.

Table 2  
*Description of the research respondents*

Profile	Categories	Frequency	Percent	Cumulative Percent
<b>Working Experience</b>	Less than one year	20	13.4	13.4
	1 to 3 years	24	16.1	29.5
	4 to 6 years	26	17.4	47.0
	7 to 10 years	40	26.8	73.8
	Over 10 years	39	26.2	100.0
<b>Job Position</b>	CEO/President	44	29.5	29.5
	CFO	52	34.9	64.4
	General manager/ deputy general manager	53	35.6	100.0
<b>Number of Employees</b>	500 to 999	20	13.4	13.4
	1000 to 3000	33	22.1	35.6
	4000 to 6000	40	26.8	62.4
	7000 to 10000	34	22.8	85.2
	More than 10000	22	14.8	100.0
<b>Types of Business</b>	Woven	34	22.8	22.8
	Denim	32	21.5	44.3
	Knitwear	34	22.8	67.1
	Woven Denim Knitwear (All)	28	18.8	85.9
	Other garment products	21	14.1	100.0
<b>Age of the company</b>	5- 10	39	26.2	26.2
	11-15	50	33.6	59.7
	16-20	36	24.2	83.9
	Above 25	24	16.1	100.0

## RESULTS

### Measurement Model Assessment

This section presents the attributes of the reflective measurement model, indicating internal consistency reliability, discriminant validity, and convergent validity, relevant to the current study. This study has analysed

the outer loadings as presented in Table 3 about the measurement model for each latent variable across all items. All outer loadings of the reflective constructions exceed the threshold value of 0.70, indicating adequate levels of indicator reliability, whereas the lowest indicator reliability is 0.60 (Hair et al., 2017).

Table 3  
Results of outer loadings

	CP	ENP	EP	FP	HC	IBP	LG	RC	SC	SEM	SOC	SP
CP1												
CP1	0.883											
CP2												
CP2	0.897											
CP3	0.919											
CP3												
ENP1												
ENP1		0.769										
ENP2		0.853										
ENP2												
ENP3												
ENP3		0.767										
ENP4												
ENP4		0.763										
EP1			0.851									
EP1												
EP2			0.691									
EP2												
EP4												
EP4			0.778									
EP5			0.718									
EP5												
FP1				0.724								
FP1												
FP2				0.846								
FP2												
FP3				0.89								
FP3												
HC1					0.697							
HC2					0.593							
HC3					0.853							

Table 3 (continued)

	CP	ENP	EP	FP	HC	IBP	LG	RC	SC	SEM	SOC	SP
HC4					0.852							
IBP1												
IBP1						0.932						
IBP2						0.98						
IBP2												
IBP3												
IBP3						0.976						
LG1												
LG1							0.871					
LG2							0.724					
LG2												
LG3												
LG3							0.998					
RC1								0.804				
RC2								0.828				
RC3								0.856				
RC5								0.839				
SC1									0.735			
SC2									0.834			
SC4									0.877			
SC5									0.795			
SEM1										0.852		
SEM1												
SEM2												
SEM2										0.86		
SEM3												
SEM3										0.709		
SOC1											0.727	
SOC2											0.846	
SOC3											0.88	
SOC4											0.879	
SP1												
SP1												0.644
SP2												0.742
SP2												
SP3												
SP3												0.812
SP4												0.832
SP4												

Note. HC-Human capital; SC-Structural capital; RC-Relational capital; SOC-Social capital; FP-Financial perspective; CP- Customer Perspective; IBP-Internal business process; LG-Learning and growth; SEM-Social and environmental measures; EP- Economic performance; SP-Social performance; ENP-Environmental performance

Reliability levels ranging from 0.60 to 0.70 are considered acceptable in the context of explanatory research, whereas values between 0.70 and 0.90 are regarded as excellent to good (Hair et al., 2019). In this research, all the dimensions of 2nd-order constructs depict the values ranging from 0.733 to 0.960 for alpha value and composite reliability, with higher reliability from 0.840 to 0.974. Furthermore, convergent validity is achieved by evaluating the average variance extracted (AVE) values, which all exceed the threshold of 0.50 from 0.572 to 0.927, thus meeting the established criteria (Hair et al., 2014) as provided in Table 4. Although the second-order constructs demonstrated very high composite reliability, redundancy was excluded through the evaluation of item loadings, the analysis of VIF values, and the establishment of discriminant validity (Fornell-Larcker and HTMT), where each dimension was theoretically grounded to ensure conceptual differentiation,

affirming that the high CR indicates internal consistency rather than redundancy among items. The Fornell & Larcker, (1981) the technique has been conducted by confirming the discriminant validity as presented Table 5. Finally, the indicators exhibit notable degrees of convergent validity along with internal consistency and reliability.

Furthermore, HTMT values should not exceed the threshold value; discriminant validity was additionally evaluated through bootstrapped HTMT confidence intervals. Hence, Henseler et al. (2015) recommended that a typical HTMT value be lower than 0.90, featuring conceptually comparable constructs as presented in Table 6 in this study. A full collinearity test has been conducted, where a VIF larger than 3.3 demonstrates pathological collinearity and common method bias in a model (Kock, 2015; Kock & Lynn, 2016) and the Table 7 presents that all the standard values of VIF, lower than 3.3 for all the constructs.

Table 4  
*Reliability and convergent validity measurement*

	<b>Cronbach's Alpha</b>	<b>Composite Reliability (Rho_C)</b>	<b>Average Variance Extracted (AVE)</b>
CP	0.882	0.927	0.810
ENP	0.797	0.868	0.622
EP	0.757	0.846	0.581
FP	0.763	0.862	0.677
HC	0.762	0.840	0.572
IBP	0.960	0.974	0.927
LG	0.920	0.903	0.760
RC	0.852	0.900	0.692
SC	0.826	0.885	0.659
SEM	0.733	0.850	0.656
SOC	0.855	0.902	0.698
SP	0.757	0.845	0.579

*Notes:* HC-Human capital; SC-Structural capital; RC-Relational capital; SOC-Social capital; FP-Financial perspective; CP- Customer Perspective; IBP-Internal business process; LG-Learning and growth; SEM-Social and environmental measures; EP- Economic performance; SP-Social performance; ENP-Environmental performance

Table 5  
Fornell-Larcker criterion

	CP	ENP	EP	FP	HC	IBP	LG	RC	SC	SEM	SOC	SP
<b>CP</b>	0.900											
<b>ENP</b>	0.426	0.789										
<b>EP</b>	0.597	0.400	0.762									
<b>FP</b>	0.395	0.403	0.158	0.823								
<b>HC</b>	0.515	0.317	0.435	0.283	0.757							
<b>IBP</b>	0.659	0.301	0.423	0.148	0.311	0.963						
<b>LG</b>	0.077	-0.072	-0.021	0.049	0.043	0.054	0.872					
<b>RC</b>	0.500	0.426	0.278	0.517	0.489	0.254	0.077	0.832				
<b>SC</b>	0.398	0.420	0.292	0.608	0.508	0.185	0.034	0.642	0.812			
<b>SEM</b>	0.599	0.397	0.348	0.336	0.293	0.392	0.086	0.453	0.271	0.810		
<b>SOC</b>	0.541	0.400	0.406	0.330	0.275	0.382	0.079	0.523	0.416	0.478	0.835	
<b>SP</b>	0.745	0.519	0.687	0.357	0.527	0.407	0.099	0.552	0.407	0.654	0.608	0.761

Notes: HC-Human capital; SC-Structural capital; RC-Relational capital; SOC-Social capital; FP-Financial perspective; CP- Customer Perspective; IBP-Internal business process; LG-Learning and growth; SEM-Social and environmental measures; EP- Economic performance; SP-Social performance; ENP-Environmental performance

Table 6  
Discriminant validity (HTMT)

	CP	ENP	EP	FP	HC	IBP	LG	RC	SC	SEM	SOC	SP	SPMS
<b>CP</b>													
<b>ENP</b>	0.504												
<b>EP</b>	0.721	0.513											
<b>FP</b>	0.47	0.52	0.213										
<b>HC</b>	0.579	0.351	0.557	0.346									
<b>IBP</b>	0.713	0.339	0.495	0.159	0.339								
<b>LG</b>	0.065	0.122	0.123	0.146	0.1	0.056							
<b>RC</b>	0.572	0.511	0.331	0.631	0.539	0.278	0.097						
<b>SC</b>	0.461	0.512	0.355	0.79	0.576	0.199	0.103	0.759					
<b>SEM</b>	0.744	0.507	0.454	0.45	0.346	0.464	0.073	0.574	0.343				
<b>SOC</b>	0.607	0.482	0.49	0.406	0.313	0.41	0.094	0.615	0.488	0.592			
<b>SP</b>	0.89	0.684	0.857	0.46	0.628	0.47	0.1	0.692	0.513	0.899	0.739		

Note. HC-Human capital; SC-Structural capital; RC-Relational capital; SOC-Social capital; FP-Financial perspective; CP- Customer Perspective; IBP-Internal business process; LG-Learning and growth; SEM-Social and environmental measures; EP- Economic performance; SP-Social performance; ENP-Environmental performance

Table 7  
Common method bias (VIF)

	SOP	SPMS
HC	1.563	1.435
RC	2.153	2.08
SC	1.887	1.886
SOC	1.685	1.397

Note. HC-Human capital; SC-Structural capital; RC-Relational capital; SOC-Social capital; SPMS- Sustainable performance measurement systems; SOP-Sustainable organisational performance

## Structural model assessment

### *Hypothesis Testing for Direct Effects*

This study employed the SMARTPLS 4.0 software to execute a bootstrap resampling procedure using 5000 resamples and utilising Bias Corrected and Accelerated (BCa) labelled as 2.50% and 97.50%, with a 0.05 significance level following two-tailed testing (Hair et al., 2017). Table 8 presents the findings of direct effects testing through structural model assessment.

As per Table 8 in the first hypothesis (H1), proposed that there is a significant relationship between intellectual capital and sustainable organisational performance. The path coefficient (H1a) linking human capital and sustainable organisational performance is 0.01, indicating a positive association. The calculated t-value of 2.617 is above the critical value of 1.96, suggesting that at a 95% confidence level, it is possible to assert that the path coefficient is statistically significant with a significance level of 0.05.

This result supports the presence of a positive and significant relationship between human capital and sustainable organisational performance ( $\beta = 0.218$ ;  $T = 2.617$  and  $P < 0.05$ ). Hence, H1a is supported. Consequently, H1b reveals the direct effects between structural capital and sustainable organisational performance, where the p value is negative 0.69; statistically insignificant ( $\beta = 0.032$ ;  $T = 0.405$  and  $P > 0.05$ ) and t value  $< 1.96$ ; thus, H1b is not supported. Similarly, H1c also suggests that the path coefficient between relational capital and sustainable organisational performance, but the p-value is not significant ( $\beta = 0.017$ ;  $T = 0.207$  and  $P > 0.05$ ). Contrarily, H1d supports the direct relationship between social capital and sustainable organisational performance with ( $\beta = 0.234$ ;  $T = 3.024$  and  $P < 0.05$ ) and has a constructive positive value, which is 0.00 by confirming the significance level of 0.05.

Table 8

*Findings of the direct effects*

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
HC -> SOP(H1a)	0.218	0.228	0.083	2.617	0.01
SC -> SOP(H1b)	0.032	0.027	0.079	0.405	0.69
RC->SOP(H1c)	0.017	0.015	0.082	0.207	0.84
SOC -> SOP(H1d)	0.234	0.237	0.077	3.024	0.00

Note.  $\beta$  - Beta coefficient; STDEV- Standard error; T- T statistics; P- Probability; Relationships are significant if \* $P < 0.058$

### ***Hypothesis Testing for Mediating Effects***

The role of mediating factors is crucial in social science and business research with the main variables, frequently recognised for theory development, that mediate the connection between exogenous and endogenous variables (Pieters, 2017). Traditionally, the concept of an indirect effect pertains to the influence exerted by an independent variable (exogenous) on a dependent variable (endogenous), utilising a mediating variable (Baron & Kenny, 1986). However, recent studies on mediation techniques have identified certain limitations in this approach. As a result, there is a widespread consensus regarding revised guidelines for optimal practices in assessing the mediating effect (Gerdin & Greve, 2004; Handzic et al., 2016; Mahmud et al., 2021; Zhao et al., 2010) This study has utilised a decision tree and a systematic process for assessing mediation, developed by Zhao et al. (2010) to investigate the indirect effects of the core conception (Baron & Kenny, 1986). This research has also provided an extensive overview of the conditions

necessary for determining different forms of mediation and non-mediation. The two primary types of mediation are partial mediation (complementary mediation) and full mediation (indirect-only mediation) (Zhao et al., 2010).

Table 9 shows the 95% confidence interval generated by bootstrapping the model using a variety of measurements as the mediating variable. In this study, bias-corrected intervals have been used. Firstly, mediation analysis was executed to depict the relevance of sustainable performance measurement systems as mediators for human capital and sustainable organisational performance. The findings revealed in the hypothesis that the indirect effect H2 (a) ( $a*b$ ) is significant with a positive coefficient value of 0.00 and the t value is more than the critical value of 2.988 with a 0.05 significance level ( $\beta = 0.117$ ;  $T = 2.988$  and  $P < 0.05$ ), thus the mediating role of sustainable performance measurement systems is established. Besides, the direct effect c ( $\beta = 0.218$ ;  $T = 2.617$  and  $P < 0.05$ ) is also significant.

Table 9  
Findings of the indirect effects

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
HC -> SPMS -> SOP(H2a)	0.117	0.117	0.039	2.988	0.00
SC -> SPMS -> SOP(H2b)	0.008	0.012	0.047	0.166	0.87
RC -> SPMS -> SOP(H2c)	0.088	0.081	0.053	1.671	0.10
SOC -> SPMS -> SOP(H2d)	0.175	0.173	0.046	3.803	0.00

Note.  $\beta$  - Beta coefficient; STDEV- Standard error; T- T statistics; P- Probability; Relationships are significant if \* $P < 0.05$

As the first and second rules of thumb are established, ( $a*b*c$ ) is positive, then the effect of human capital on sustainable organisational performance is partially (complementary) mediated by sustainable performance measurement systems based on the model of the decision tree (Zhao et al., 2010).

In H2(b), the hypothesis proposed that sustainable performance measurement systems mediate the relationship between structural capital and sustainable organisational performance. To identify the type of mediation, the indirect effect ( $a*b$ ) is insignificant because the criteria of the significance level of 0.05 are not established ( $\beta = 0.008$ ;  $T = 0.166$  and  $P > 0.05$ ), and the mediating role of sustainable performance measurement systems is not determined. Furthermore, the direct effect c ( $\beta = 0.032$ ;  $T = 0.405$  and  $P > 0.05$ ) is also insignificant. Hence, the concept of non-mediation is defined as both relationships are not positive in this study.

In the H2(c) hypothesis, the mediating effect of sustainable performance measurement systems between relational

capital and sustainable organisational performance was proposed. The findings have revealed that the indirect effect H2(c) ( $a*b$ ) is insignificant ( $\beta = 0.088$ ;  $T = 1.671$  and  $P > 0.05$ ) while the first condition is not fulfilled. Afterwards, the direct effect c ( $\beta = 0.017$ ;  $T = 0.207$  and  $P > 0.05$ ) is also not significant. This situation states a non-mediation effect, thereby rejecting the hypothesis that sustainable performance measurement systems play an intervening role in the relationship between relational capital and sustainable organisational performance.

In the H2 (d) hypothesis, the assumptions articulate that sustainable performance measurement systems mediate the relationship between social capital and sustainable organisational performance, the findings depicted that the indirect effect H2 (d)( $a*b$ ) is significant with a significance level of 0.05 and t value is higher than 1.96; ( $\beta = 0.175$ ;  $T = 3.803$  and  $P < 0.05$ ) with a path coefficient of 0.00. When ( $a*b*c$ ) is determined, the hypothesis is accepted.

The  $R^2$  represent the cumulative effect of all the exogenous variables on one or more endogenous variables (Hair et al., 2019).

Despite R<sup>2</sup>'s widespread acceptance across academic fields, researchers still need to settle on a "rough" rule of thumb to determine what constitutes an adequate R<sup>2</sup>, with values of 0.75, 0.50, and 0.25 corresponding to strong, moderate, and weak levels of predictive ability (Hair et al., 2014). For this study, the majority of the R<sup>2</sup> values show a strong to moderate level of influence except FP and LG, as shown in Table 10. This model also used F<sup>2</sup> values, while the values show more than 0.02 in this study. The study has conducted the

predictive accuracy of the PLS model by the effect size Q<sup>2</sup> suggested by Geisser (1974) and Stone (1974). Furthermore, Q<sup>2</sup> values exceeding 0.25 and 0.50 indicate moderate and substantial predictive significance of the Partial Least Squares Structural Equation Modelling (PLS-SEM) model (Hair et al., 2020). According to the study's findings, it is observed that all values for the endogenous variable exceed zero, indicating that the criteria have been established through Q<sup>2</sup> prediction presented in Table 11.

Table 10  
R-squared value

	R-square	R-square Adjusted
<b>CP</b>	0.839	0.838
<b>ENP</b>	0.568	0.565
<b>EP</b>	0.704	0.702
<b>FP</b>	0.275	0.271
<b>IBP</b>	0.624	0.621
<b>LG</b>	0.012	0.006
<b>SEM</b>	0.562	0.559
<b>SOP</b>	0.587	0.572
<b>SP</b>	0.808	0.806
<b>SPMS</b>	0.464	0.449

Note. FP-Financial perspective; CP- Customer Perspective; IBP-Internal business process; LG-Learning and growth; SEM-Social and environmental measures; SPMS-Sustainable performance measurement systems; SOP-Sustainable organisational performance; EP- Economic performance; SP-Social performance; ENP- Environmental performance

Table 11  
PLS Predict (Q<sup>2</sup>)

	Q <sup>2</sup> predict	RMSE	MAE
<b>SOP</b>	0.441	0.754	0.606
<b>SPMS</b>	0.416	0.766	0.614

Note. SOP- Sustainable organisational performance; SPMS- Sustainable performance measurement systems

## DISCUSSION

The present study has posited an initial hypothesis (H1) suggesting a substantial correlation between intellectual capital and sustainable organisational performance. Findings presented in Table 8, both human and social capital (H1a and H1b) significantly contribute to the development of sustainable firm performance, as indicated ( $P < 0.05$ ) within Bangladeshi RMG companies. Being such a young nation with an emerging frontier market, Bangladesh stands to gain enormously from the arrival of highly skilled people who have the expertise in driving economic development and business performance. Human capital positively and significantly influences both the financial performance indicators (earnings and revenue growth) as well as non-financial (job satisfaction and staff efficiency) in RMG companies of Bangladesh (Kamal & Begum, 2019). Human capital pertains to the acquisition of knowledge and skills by individuals, facilitating successful decision-making in numerous settings, whereas social capital is derived from relationships among individuals (Nuryanto et al., 2020). This observation elucidated that social capital is a motivating tool, especially in a dynamic and rapidly changing socio-economic business environment, such as the Bangladesh economy (Hassan, 2022).

On the contrary, there seems to be no significant effect of structural and relational capital (H1b and H1c) on sustainable organisational performance in the context of this study's findings ( $P > 0.05$ ). The findings are significant as they indicate

that the utilisation of structural capital encompassing organisational structure, systems and procedures, policies, intellectual assets, and infrastructure does not provide any future benefit for the sustainable performance of RMG enterprises in Bangladesh. Contrarily, structural and relational capital (H1b and H1c) does not appear to substantially influence sustainable organisational performance in the context of the present study ( $P > 0.05$ ). The reason can be explained that RMG firms, in general practice, labour-intensive production with a low-cost manufacturing system to enhance their competitiveness and constrained by costs and immediate obstacles, do not prioritise making future investments in infrastructure and technological innovation to achieve their objectives. Regarding empirical evidence, some studies found that the role of structural capital and sustainable organisational performance is not significant (Aljuboori et al., 2022; Ullah et al., 2023). Similarly, the study's findings do not indicate any statistical significance of relational capital in influencing sustainable firm performance among RMG companies in Bangladesh. The primary rationale may be that companies are more focused on establishing short-term relationships than long-term ones with stakeholders. In this aspect, customer preferences and decisions are subject to constant changes in a volatile market, and foreign buyers prefer manufacturers who can deliver products to the marketplace more quickly than their rivals (Chowdhury et al., 2023). Hence, the insignificant findings of are in similar alignment with (Andreeva et al., 2021), who

suggested that intellectual capital can be varied based on the criteria of the external environment, industrial circumstances, and competitive dynamics situation.

In case of indirect effect findings, the mediating role of sustainable performance measurement systems in the relationship between intellectual capital (human capital, and social capital, H2a and H2d) and sustainable organisational performance has been observed in the current study. This outcome corroborates (Pratolo et al., 2022), who observed that when organisational strategic resources are incorporated into a solid framework, e.g., performance measurement systems, they can enhance alignment, cooperation, and leadership to help organisations achieve their goals more effectively. Theoretically, findings align with the central conception of the “fit as mediation” approach in contingency theory (Venkatraman, 1989). Hence, organisations are more likely to examine their fundamental critical resources and skills by using management control systems, which results in improved performance (Drazin & de Ven, 1985). In contrast to anticipated outcomes, hypothesis H2(b) and H2(c) ( $P > 0.05$ ) have demonstrated a lack of correlation regarding the mediating role of sustainable performance measurement systems between intellectual capital (structural capital and relational capital) and sustainable organisational performance. In this aspect, the primary rationale is that there is an absence of direct affiliation between structural and relational capital on sustainable firm performance.

## CONCLUSION

Within the framework of sustainable performance measurement systems, this research offered new understandings to the research community about the relationships between intellectual capital (human, structural, relational, and social capital) and the achievement of long-term organisational goals. With this issue, it is worthwhile to investigate the unique role of numerous intellectual capital dimensions, including mediation facts, on company performance (Wang et al., 2018). Furthermore, there is a current emphasis in intellectual capital research on the necessity of redirecting attention from an organisation to a sustainability-driven structure. Meanwhile, in such conditions, there is a lack of clarity regarding the specific managerial functions via which organisations might effectively utilise knowledge-related resources to improve sustainable-based performance. With this stream, this study has provided a layout to investigate the potential of different components of sustainable performance measurement systems in effectively managing intellectual capital to achieve a balanced integration of economic, social, and environmental performance.

## Implications for Theory

Firstly, the multifaceted views of intellectual capital, combined with the multidimensional perspective of sustainable organisational performance, are a result of the industrial economy's transition to a knowledge-based economy and the digital era. After reviewing the findings of prior studies, there is still

a dilemma about how to connect with intellectual capital with sustainability-based performance, because sustainability is the ultimate demand of stakeholders in the current business world, which is quite equivocal, as well as in terms of measurement (Akhtar et al., 2015; Lasiyono, 2019). Therefore, the study proposes and endorses a framework to create possible connections between intellectual capital (human capital, structural capital, relational capital, and social capital) influencing sustainable organisational performance (social, environmental, and economic) from the vantage ground of TBL, synthesising the relevant research gaps from previous literature. From a theoretical perspective, ICBV theory provides as the underlying framework that illustrates intellectual capital as the critical source of competitive advantage for achieving organisational sustainability, whereas preceding studies have frequently attempted to apply RBV theory.

### **Practical Implications**

In addition to theoretical remarks, this study proposes that owners and managers of RMG businesses should allocate resources towards knowledge assets, which play a crucial role in promoting the long-term viability of the business in the sustainable-based competitive market. RMG managers are still struggling to implement knowledge-related resources towards sustainable organisational performance. Furthermore, the findings can provide an advantage to the management accountants in RMG industries

on how to develop an effective, sustainable performance measurement system aligning with the knowledge-based resources in the organisations. Additionally, the current study serves as a blueprint for practitioners and organisations from a holistic perspective. For instance, RMG managers can obtain a more sophisticated knowledge to align the components of intellectual capital while engaging with stakeholders, and afterwards determine how to evaluate them effectively, thereby enhancing the firm's sustainable performance. Second, this study highlights a practical technique to reduce the gaps between primary and secondary stakeholders to improve their relationship with the organisations because both stakeholders need to prioritise intellectual capital to imply and harmonise with the social and environmental factors with economic metrics. Third, the research findings hold substantial ramifications for policymakers and regulatory bodies in Bangladesh.

### **Limitations and Recommendations for Future Research**

Despite extensive research on intellectual capital and its impact on sustainable organisational performance, there is still room to explore the contents and context. Future researchers can employ qualitative data collection techniques, such as conducting interviews with experts, to gain a comprehensive picture of the research topic at hand. This study employed a cross-sectional design, wherein exposure and result were evaluated at one specific time; thus, causal connections cannot be determined.

This methodology corresponds with the study's aim of investigating relationships among variables. Notwithstanding this restriction, the findings yield significant insights into these associations and establish a basis for future longitudinal or experimental research to further explore causal pathways. Hence, the ongoing development of sustainability practices and resources indicates a necessity for longitudinal research to evaluate their influence on sustainability performance levels. Besides, the researcher may develop questionnaire items with a mixture of open-ended questions and rating-scale questions. To conclude, as an itinerary, this study can be considered as a contribution to knowledge-intensive organisations to enhance their understanding of the application of intellectual capital in transitioning the industry from labour-intensive to knowledge-driven and ultimately achieving sustainability amidst competition in the current business landscape.

## ACKNOWLEDGEMENT

We would like to thank all the participants who took part in completing the survey questionnaire and sharing data about this study. We express our gratitude to Asia Pacific University of Technology & Innovation, Bukit Jalil, Malaysia for all the valuable support and collaboration.

## REFERENCES

- Acuña, E., & Rodriguez, C. (2004). The treatment of missing values and its effect on classifier accuracy. In D. Banks, L. House, F. R. McMorris, P. Arabie, & W. Gaul (Eds.), *Classification, clustering, and data mining applications* (pp. 639-647). Springer. [https://doi.org/10.1007/978-3-642-17103-1\\_60](https://doi.org/10.1007/978-3-642-17103-1_60)
- Aggarwal, S., Dsouza, S., Joshi, M., Antoun, R., & Phan, D. H. T. (2025). Environmental, social and governance investing: Systematic literature review using the ADO model. *Journal of Accounting Literature*. Advance online publication. <https://doi.org/10.1108/JAL-11-2024-0319>
- Akhtar, C. S., Ismail, K., Ndaliman, M. A., Hussain, J., & Haider, M. (2015). Can intellectual capital of SMEs help in their sustainability efforts? *Journal of Management Research*, 7(2), Article 82. <https://doi.org/10.5296/jmr.v7i2.6930>
- Alam, M. N., Turi, J. A., Khastoori, S., Alias, R. B., Rahman, M. A., & Hossain, M. S. H. (2021). *Does environmental management practice play a mediating role between green intellectual capital and green human resource management?* [Preprint]. Research Square. <https://doi.org/10.21203/rs.3.rs-443303/v1>
- Aljuboori, Z. M., Singh, H., Haddad, H., Al-Ramahi, N. M., & Ali, M. A. (2022). Intellectual capital and firm performance correlation: The mediation role of innovation capability in Malaysian manufacturing SMEs perspective. *Sustainability*, 14(1), Article 154. <https://doi.org/10.3390/su14010154>
- Andreeva, T., Garanina, T., Sáenz, J., Aramburu, N., & Kianto, A. (2021). Does country environment matter in the relationship between intellectual capital and innovation performance? *Journal of Business Research*, 136, 263-273. <https://doi.org/10.1016/j.jbusres.2021.07.038>
- Asiaei, K., Barani, O., Rezaee, Z., Bontis, N., & Najaf, K. (2026). Leveraging environmental management accounting and green ambidexterity for competitive advantage: A natural resource orchestration view. *Accounting Forum*. Advance

- online publication. <https://doi.org/10.1080/01559982.2025.2604169>
- Asiaei, K., Bontis, N., Barani, O., & Jusoh, R. (2021). Corporate social responsibility and sustainability performance measurement systems: Implications for organisational performance. *Journal of Management Control*, 32(1), 85-126. <https://doi.org/10.1007/s00187-021-00317-4>
- Asiaei, K., & Jusoh, R. (2015). A multidimensional view of intellectual capital: The impact on organisational performance. *Management Decision*, 53(3), 668-697. <https://doi.org/10.1108/MD-05-2014-0300>
- Asiaei, K., & Jusoh, R. (2017). Using a robust performance measurement system to illuminate intellectual capital. *International Journal of Accounting Information Systems*, 26, 1-19. <https://doi.org/10.1016/j.accinf.2017.06.003>
- Asiaei, K., Jusoh, R., & Bontis, N. (2018). Intellectual capital and performance measurement systems in Iran. *Journal of Intellectual Capital*, 19(2), 294-320. <https://doi.org/10.1108/JIC-11-2016-0125>
- Asiaei, K., O'Connor, N. G., Barani, O., & Joshi, M. (2023). Green intellectual capital and ambidextrous green innovation: The impact on environmental performance. *Business Strategy and the Environment*, 32(1), 369-386. <https://doi.org/10.1002/bse.3136>
- Asiaei, K., Rezaee, Z., Bontis, N., Barani, O., & Sapici, N. S. (2021). Knowledge assets, capabilities, and performance measurement systems: A resource orchestration theory approach. *Journal of Knowledge Management*, 25(8), 1947-1976. <https://doi.org/10.1108/JKM-09-2020-0721>
- Astuti, P. D., Datrini, L. K., & Chariri, A. (2023). Understanding the antecedents and consequences of sustainable competitive advantage: Testing intellectual capital and organisational performance. *Economies*, 11(4), Article 120. <https://doi.org/10.3390/economies11040120>
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182. <https://doi.org/10.1037/0022-3514.51.6.1173>
- Berg, A., Chhaparia, H., Hedrich, S., & Magnus, K.-H. (2021, March 25). *What's next for Bangladesh's garment industry, after a decade of growth?* McKinsey & Company. <https://www.mckinsey.com/industries/retail/our-insights/whats-next-for-bangladeshs-garment-industry-after-a-decade-of-growth>
- Berg, A., Ganesan, V., Herath, G., Hügl, J., & Krishnan, P. (2023, May 31). *Redesigning apparel manufacturing in Asia: A pattern for resilience*. McKinsey & Company. <https://www.mckinsey.com/industries/retail/our-insights/redesigning-apparel-manufacturing-in-asia-a-pattern-for-resilience>
- Bangladesh Garment Manufacturers and Exporters Association. (2022). What awaits RMG industry in 2022. *The Apparel Story*, 6-9.
- Chowdhury, M. U., Sui, S., Morgan, H. M., & Li, D. (2023). The effects of firm relational capital on export performance: The moderating effects of technological turbulence. In *Proceedings of the 56th Hawaii International Conference on System Sciences* (pp. 4791-4798). University of Hawai'i at Mānoa.
- Chung, L. (2021). *What is a good survey response rate for online customer surveys?* Delighted. <https://delighted.com/blog/average-survey-response-rate>
- Chartered Institute of Management Accountants. (2020). *Promote resiliency and sustainability with the six capitals*. <https://www.cimaglobal.com/Members/Insights/2020-CIMA-Insights/Promote-resiliency-and-sustainability-with-the-6-capitals/>

- Curado, C., & Bontis, N. (2006). The knowledge-based view of the firm and its theoretical precursor. *International Journal of Learning and Intellectual Capital*, 3(4), 367-381. <https://doi.org/10.1504/IJLIC.2006.011747>
- DataBD.CO. (2019, July 1). *Bangladesh RMG sector: Difficult relationship with sustainability*. <https://databd.co/stories/bangladesh-rmg-sector-difficult-relationship-with-sustainability-4312>
- Drazin, R., & Van de Ven, A. H. (1985). Alternative forms of fit in contingency theory. *Administrative Science Quarterly*, 30(4), 514-539. <https://doi.org/10.2307/2392695>
- Dumay, J., & Garanina, T. (2013). Intellectual capital research: A critical examination of the third stage. *Journal of Intellectual Capital*, 14(1), 10-25. <https://doi.org/10.1108/14691931311288995>
- Edvinsson, L., & Malone, M. S. (1997). *Intellectual capital: Realising your company's true value by finding its hidden brainpower*. Harper Business.
- Elkington, J. (1998). *Cannibals with forks: The triple bottom line of 21st century business*. New Society Publishers.
- Figge, F., Hahn, T., Schaltegger, S., & Wagner, M. (2002). The sustainability balanced scorecard—Linking sustainability management to business strategy. *Business Strategy and the Environment*, 11(5), 269-284. <https://doi.org/10.1002/bse.339>
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50. <https://doi.org/10.2307/3151312>
- Geisser, S. (1974). A predictive approach to the random effect model. *Biometrika*, 61(1), 101-107. <https://doi.org/10.1093/biomet/61.1.101>
- Gerdin, J., & Greve, J. (2004). Forms of contingency fit in management accounting research: A critical review. *Accounting, Organizations and Society*, 29(3-4), 303-326. [https://doi.org/10.1016/S0361-3682\(02\)00096-X](https://doi.org/10.1016/S0361-3682(02)00096-X)
- Ghorbani, H. (2019). Mahalanobis distance and its application for detecting multivariate outliers. *Facta Universitatis, Series: Mathematics and Informatics*, 34(3), 583-595. <https://doi.org/10.22190/FUMI1903583G>
- Gond, J.-P., Grubnic, S., Herzig, C., & Moon, J. (2012). Configuring management control systems: Theorising the integration of strategy and sustainability. *Management Accounting Research*, 23(3), 205-223. <https://doi.org/10.1016/j.mar.2012.06.003>
- Grazier, T. (2025, August 7). *A manufacturer's guide to sustainability*. Good.Lab. <https://getgoodlab.com/resources/sustainability-manufacturing/>
- Gross-Gołacka, E., Kusterka-Jefmańska, M., & Jefmański, B. (2020). Can elements of intellectual capital improve business sustainability? The perspective of managers of SMEs in Poland. *Sustainability*, 12(4), Article 1545. <https://doi.org/10.3390/su12041545>
- Gross-Gołacka, E., Kusterka-Jefmańska, M., Spałek, P., & Jefmański, B. (2021). Perception of intellectual capital and its impact on business sustainability: Evidence from small, medium, and large enterprises. *E&M Economics and Management*, 24(2), 35-50. <https://doi.org/10.15240/tul/001/2021-2-003>
- Hair, J. F., Jr., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2-24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Hair, J. F., Jr., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modelling (PLS-SEM)* (2nd ed.). SAGE Publications.
- Hair, J. F., Jr., Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research*, 109, 101-110. <https://doi.org/10.1016/j.jbusres.2019.11.069>

- Hair, J. F., Jr., Sarstedt, M., & Ringle, C. M. (2019). Rethinking some of the rethinking of partial least squares. *European Journal of Marketing*, 53(4), 566-584. <https://doi.org/10.1108/EJM-10-2018-0665>
- Hair, J. F., Jr., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modelling (PLS-SEM): An emerging tool in business research. *European Business Review*, 26(2), 106-121. <https://doi.org/10.1108/EBR-10-2013-0128>
- Handzic, M., Ozlen, K., & Durmic, N. (2016). A contingency approach to knowledge management: Finding the best fit. *International Journal of Knowledge Management*, 12(1), 31-44. <https://doi.org/10.4018/IJKM.2016010103>
- Hart, S. L. (1995). A natural-resource-based view of the firm. *Academy of Management Review*, 20(4), 986-1014. <https://doi.org/10.5465/AMR.1995.9512280033>
- Hassan, F. (2022, November 14). A renewed vision for a sustainable RMG industry. *The Business Standard*. <https://www.tbsnews.net/economy/rmg/renewed-vision-sustainable-rmg-industry-531446>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modelling. *Journal of the Academy of Marketing Science*, 43(1), 115-135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hermawan, S., Hariyanto, W., & Biduri, S. (2020). Intellectual capital, business performance, and competitive advantage: An empirical study of pharmaceutical companies. *Quality—Access to Success*, 21(175), 103-106.
- Islam, M. N., & Rahman, S. M. K. (2022). *Corporate environmental management accounting practising and reporting in Bangladesh* [Preprint]. arXiv. <https://arxiv.org/abs/2208.12541>
- Kamal, M. A., & Begum, N. N. (2019). A multivariate analysis of human capital: Evidence from the readymade garments industry of Bangladesh. *Asian Journal of Empirical Research*, 9(3), 46-64. <https://doi.org/10.18488/journal.1007/2019.9.3/1007.3.46.64>
- Khalique, M., Bontis, N., Bin Shaari, J. A. N., Yaacob, M. R., & Ngah, R. (2018). Intellectual capital and organisational performance in Malaysian knowledge-intensive SMEs. *International Journal of Learning and Intellectual Capital*, 15(1), 20-36. <https://doi.org/10.1504/IJLIC.2018.088345>
- Khalique, M., & de Pablos, P. O. (2015). Intellectual capital and performance of electrical and electronics SMEs in Malaysia. *International Journal of Learning and Intellectual Capital*, 12(3), 251-269. <https://doi.org/10.1504/IJLIC.2015.070166>
- Khan, N. U., Anwar, M., Li, S., & Khattak, M. S. (2021). Intellectual capital, financial resources, and green supply chain management as predictors of financial and environmental performance. *Environmental Science and Pollution Research*, 28(16), 19755-19767. <https://doi.org/10.1007/s11356-020-12243-4>
- Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of E-Collaboration*, 11(4), 1-10. <https://doi.org/10.4018/ijec.2015100101>
- Kock, N., & Lynn, G. S. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. *Journal of the Association for Information Systems*, 13(7), 546-580. <https://doi.org/10.17705/1jais.00302>
- Lasiyono, U. (2019). The influence of intellectual capital on corporate sustainability through management accounting practices and corporate performance of agroindustry companies based in East Java. In *Proceedings of the International Conference on Innovation in Research (ICIIR*

- 2018): *Economics and Management Science* (pp. 104-122). Atlantis Press. <https://doi.org/10.2991/icmr-18.2019.21>
- Li, Y., Li, J., & Zhai, Y. (2024). Intellectual capital and sustainability performance: The mediating role of digitalisation. *Journal of Intellectual Capital*, 25(5/6), 867-890. <https://doi.org/10.1108/JIC-06-2023-0129>
- Lindner, J. R., & Wingenbach, G. J. (2002). Communicating the handling of nonresponse error in *Journal of Extension* research in brief articles. *Journal of Extension*, 40(6).
- Maas, K., Schaltegger, S., & Crutzen, N. (2016). Integrating corporate sustainability assessment, management accounting, control, and reporting. *Journal of Cleaner Production*, 136, 237-248. <https://doi.org/10.1016/j.jclepro.2016.05.008>
- Mahmud, M., Soetanto, D., & Jack, S. (2021). A contingency theory perspective of environmental management: Empirical evidence from entrepreneurial firms. *Journal of General Management*, 47(1), 3-17. <https://doi.org/10.1177/0306307021991489>
- Malik, S., Cao, Y., Mughal, Y. H., Kundi, G. M., Mughal, M. H., & Ramayah, T. (2020). Pathways towards sustainability in organisations: Empirical evidence on the role of green human resource management practices and green intellectual capital. *Sustainability*, 12(8), Article 3228. <https://doi.org/10.3390/su12083228>
- Martín-de-Castro, G., Delgado-Verde, M., López-Sáez, P., & Navas-López, J. E. (2011). Towards an intellectual capital-based view of the firm: Origins and nature. *Journal of Business Ethics*, 98(4), 649-662. <https://doi.org/10.1007/s10551-010-0644-5>
- Massaro, M., Dumay, J., Garlatti, A., & Dal Mas, F. (2018). Practitioners' views on intellectual capital and sustainability: From a performance-based to a worth-based perspective. *Journal of Intellectual Capital*, 19(2), 367-386. <https://doi.org/10.1108/JIC-02-2017-0033>
- McFall-Johnsen, M. (2020, January 31). *These facts show how unsustainable the fashion industry is*. World Economic Forum. <https://www.weforum.org/agenda/2020/01/fashion-industry-carbon-unsustainable-environment-pollution/>
- Memon, M. A., Thurasamy, R., Cheah, J.-H., Ting, H., Chuah, F., & Cham, T.-H. (2023). Addressing common method bias, operationalisation, sampling, and data collection issues in quantitative research: Review and recommendations. *Journal of Applied Structural Equation Modelling*, 7(2), i-xiv. [https://doi.org/10.47263/JASEM.7\(2\)01](https://doi.org/10.47263/JASEM.7(2)01)
- Mio, C., Costantini, A., & Panfilo, S. (2022). Performance measurement tools for sustainable business: A systematic literature review on the sustainability balanced scorecard use. *Corporate Social Responsibility and Environmental Management*, 29(2), 367-384. <https://doi.org/10.1002/csr.2206>
- Muchran. (2020). Effect of intellectual capital on sustainable financial performance of Indonesian pharmaceutical firms with the moderating role of knowledge management. *Systematic Reviews in Pharmacy*, 11(1), 203-212. <https://doi.org/10.5530/srp.2020.1.27>
- Najib, H., & Nawangsari, L. C. (2021). Effect of intellectual capital on organisational sustainability with employee innovative behaviour as an intervening variable in PT Jaya Maritime Services. *European Journal of Business and Management Research*, 6(1), 158-163. <https://doi.org/10.24018/ejbmr.2021.6.1.714>
- Noor, A., & Nawangsari, L. C. (2021). The effect of intellectual capital on organisational sustainability through knowledge management among employees of PD Dharma Jaya in regionally owned enterprises of DKI Jakarta. *European Journal of Business and Management Research*, 6(3), 226-235. <https://doi.org/10.24018/ejbmr.2021.6.3.909>

- Nuryanto, U. W., Mz, M. D., Sutawidjaya, A. H., & Saluy, A. B. (2020). The impact of social capital and organisational culture on improving organisational performance. *International Review of Management and Marketing*, 10(3), 93-100. <https://doi.org/10.32479/irmm.9923>
- Obeidat, U., Obeidat, B., Alrowwad, A., Alshurideh, M., Masa'deh, R., & Abuhashesh, M. (2021). The effect of intellectual capital on competitive advantage: The mediating role of innovation. *Management Science Letters*, 11, 1331-1344. <https://doi.org/10.5267/j.msl.2020.11.006>
- Omer, M. A. B., & Noguchi, T. (2020). A conceptual framework for understanding the contribution of building materials to the achievement of the Sustainable Development Goals (SDGs). *Sustainable Cities and Society*, 52, Article 101869. <https://doi.org/10.1016/j.scs.2019.101869>
- Pangidoan, O. T., & Nawangsari, L. C. (2022). The effect of human capital, structural capital, relational capital, and innovative behaviour on the organisational performance of PT PLN (Persero), Bekasi. *Linguistics and Culture Review*, 6(S1), 773-796. <https://doi.org/10.21744/lingcure.v6nS1.2153>
- Phonthanukitithaworn, C., Srisathan, W. A., Ketkaew, C., & Naruetharadhol, P. (2023). Sustainable development towards openness in SME innovation: Taking advantage of intellectual capital, sustainable initiatives, and open innovation. *Sustainability*, 15(3), Article 2126. <https://doi.org/10.3390/su15032126>
- Pieters, R. (2017). Mediation analysis: Inferring causal processes in marketing from experiments. In P. S. H. Leeftang, J. E. Wieringa, T. H. A. Bijmolt, & K. H. Pauwels (Eds.), *Advanced methods for modeling markets* (pp. 235-263). Springer. [https://doi.org/10.1007/978-3-319-53469-5\\_8](https://doi.org/10.1007/978-3-319-53469-5_8)
- Pratolo, S., Utami, T. P., & Sofyani, H. (2022). The influence of intellectual capital on the performance of higher education institutions: The mediating role of performance measurement systems. *JIA (Jurnal Ilmiah Akuntansi)*, 7(2), 200-216. <https://doi.org/10.23887/jia.v7i2.51850>
- Reed, K. K., Lubatkin, M., & Srinivasan, N. (2006). Proposing and testing an intellectual capital-based view of the firm. *Journal of Management Studies*, 43(4), 867-893. <https://doi.org/10.1111/j.1467-6486.2006.00614.x>
- Roxas, B., & Chadee, D. (2016). Knowledge management view of environmental sustainability in manufacturing SMEs in the Philippines. *Knowledge Management Research & Practice*, 14(4), 514-524. <https://doi.org/10.1057/kmp.2015.30>
- Saba, S., Gardazi, N., Fahmi, A., Hassan, S., & Sabo, B. M. (2023). A bibliometric analysis of corporate sustainability performance: Current status, development, and future trends. *International Journal of Professional Business Review*, 1-21.
- Sabir, M. R., Rehman, M., & Asghar, W. (2020). Assessing the mediating role of organisational learning capability in the relationship between green intellectual capital and business sustainability. *Journal of Business and Social Review in Emerging Economies*, 6(4), 1273-1285. <https://doi.org/10.26710/jbsec.v6i4.1416>
- Sarkar, A., Qian, L., & Peau, A. K. (2020). Overview of green business practices within the Bangladeshi RMG industry: Competitiveness and sustainable development perspective. *Environmental Science and Pollution Research*, 27(18), 22888-22901. <https://doi.org/10.1007/s11356-020-08816-y>
- Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill-building approach* (7th ed.). Wiley.
- Sekaran, U., & Bougie, R. (2020). *Research methods for business: A skill-building approach* (8th ed.). Wiley.

- Shaari, J. A. N. B., Isa, A. H. B. M., & Khalique, M. (2018). *Impact of intellectual capital on organisational performance of ICT SMEs in Penang, Malaysia*. College of Management Sciences.
- Stone, M. (1974). Cross-validatory choice and assessment of statistical predictions. *Journal of the Royal Statistical Society: Series B (Methodological)*, 36(2), 111-147. <https://doi.org/10.1111/j.2517-6161.1974.tb00994.x>
- Subramaniam, M., & Youndt, M. A. (2005). The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal*, 48(3), 450-463. <https://doi.org/10.5465/AMJ.2005.17407911>
- Suki, N. M., Suki, N. M., Sharif, A., Afshan, S., & Rexhepi, G. (2023). Importance of green innovation for business sustainability: Identifying the key role of green intellectual capital and green supply chain management. *Business Strategy and the Environment*, 32(4), 1542-1558. <https://doi.org/10.1002/bse.3204>
- Sukri, S., & Yusoff, R. Z. (2021). Effect of technology strategy on organisational performance of manufacturing companies: A note on how to conduct data screening and preliminary analysis. *International Journal of Business and Technopreneurship*, 11(2), 51-68.
- Textile Today. (2023, May). Sustainability in RMG: A must, not an option, to retain growth. *Textile Today*. <https://www.textiletoday.com.bd/sustainability-rmg-must-not-an-option-retain-growth>
- Thanh, N. H., & Cong, B. T. (2024). Investigating the mediating role of green performance measurement systems in the nexus between green intellectual capital and environmental performance. *Social Responsibility Journal*, 20(10), 2237-2258. <https://doi.org/10.1108/SRJ-11-2023-0663>
- Torre, C., Tommasetti, A., & Maione, G. (2020). Technology usage, intellectual capital, firm performance, and employee satisfaction: The accountants' idea. *The TQM Journal*, 33(3), 545-567. <https://doi.org/10.1108/TQM-04-2020-0070>
- Ullah, S., Mehmood, T., & Ahmad, T. (2023). Green intellectual capital and green HRM enabling organisations to go green: The mediating role of green innovation. *International Journal of Innovation Science*, 15(2), 245-259. <https://doi.org/10.1108/IJIS-12-2021-0222>
- Umar, T. R., Shamsudin, F. M., Subramaniam, C., & Johari, J. (2015). Actual voluntary turnover, job embeddedness, pay satisfaction, and the moderating effect of perceived alternative job opportunities: Data screening and preliminary analysis. *International Journal of Academic Research in Business and Social Sciences*, 5(10). <https://doi.org/10.6007/IJARBS/v5-i10/1861>
- Venkatraman, N. (1989). The concept of fit in strategy research: Toward verbal and statistical correspondence. *Academy of Management Review*, 14(3), 423-444. <https://doi.org/10.5465/AMR.1989.4279078>
- Wang, Z., Cai, S., Liang, H., Wang, N., & Xiang, E. (2021). Intellectual capital and firm performance: The mediating role of innovation speed and quality. *The International Journal of Human Resource Management*, 32(6), 1222-1250. <https://doi.org/10.1080/09585192.2018.1511611>
- Wijethilake, C. (2017). Proactive sustainability strategy and corporate sustainability performance: The mediating effect of sustainability control systems. *Journal of Environmental Management*, 196, 569-582. <https://doi.org/10.1016/j.jenvman.2017.03.057>
- World Bank. (2019). *The effects of international scrutiny on manufacturing workers* (Policy Research Working Paper No. 9065). <https://openknowledge.worldbank.org/bitstream/handle/10986/32674/WPS9065.pdf>

- Xu, J., & Li, J. (2020). The interrelationship between intellectual capital and firm performance: Evidence from China's manufacturing sector. *Journal of Intellectual Capital*, 22(2), 313-341. <https://doi.org/10.1108/JIC-08-2019-0189>
- Xu, J., Shang, Y., Yu, W., & Liu, F. (2019). Intellectual capital, technological innovation, and firm performance: Evidence from China's manufacturing sector. *Sustainability*, 11(19), Article 5328. <https://doi.org/10.3390/su11195328>
- Yusliza, M. Y., Yong, J. Y., Tanveer, M. I., Ramayah, T., Noor Faezah, J., & Muhammad, Z. (2020). A structural model of the impact of green intellectual capital on sustainable performance. *Journal of Cleaner Production*, 249, Article 119334. <https://doi.org/10.1016/j.jclepro.2019.119334>
- Yusoff, Y. M., Omar, M. K., Kamarul Zaman, M. D., & Samad, S. (2019). Do all elements of green intellectual capital contribute towards business sustainability? Evidence from the Malaysian context using the partial least squares method. *Journal of Cleaner Production*, 234, 626-637. <https://doi.org/10.1016/j.jclepro.2019.06.153>
- Zhao, X., Lynch, J. G., Jr., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research*, 37(2), 197-206. <https://doi.org/10.1086/651257>

**APPENDIX: SURVEY INSTRUMENT**

**Measurement items**

***Section 1. Intellectual Capital (IC)***

*The following items explore aspects of economic performance over the last five years. Please tick (☐) a number from 1 to 7 to indicate your response. 1- Strongly disagree 2- Moderately disagree; 3-Disagree; 4- Neutral; 5- Lightly agree; 6- Agree; 7- Strongly Agree)*

Variable	Item
<b>Human Capital</b>	Our organisation has a highly competent and creative management team
	Our organisation encourages the sharing of ideas, knowledge and practices
	Our organisation recognises the importance of knowledge as a strategic asset
	Our organisation encourages and supports research and development activities
	Our organisation has an innovative and professional workforce
<b>Structural Capital</b>	Our organisation provides the infrastructure for employees to access relevant information
	Our organisational system and procedures support innovation
	Our organisation’s policies, procedures, databases and networks
	Our organisation keeps track of and makes full use of our intellectual assets such as patents and copyrights
	This company has an easily accessible information system
<b>Relational Capital</b>	Our customers are highly loyal to our firm
	Our organisation is recognised by external agents (customers, suppliers, competitors, and the general public)
	Our organisation is collaborative with international organisations can enhance our performance
	Our organisation has enough distribution channels for the satisfaction of our customers
	The enterprise effectively cooperates with experts or consultancies
<b>Social Capital</b>	Our employees are skilled at collaborating with each other to diagnose and solve problems
	Our employees have good relationships and communication with each other in performing their duties
	Our employees co-operate with each other to accomplish team tasks
	Our employees exchange experiences with people from different departments of the organisation
	Our employees like to share information and learn from each other

**Section 2. Sustainable Performance Measurement Systems (SPMS)**

*The following items explore aspects of economic performance over the last five years. Please tick (☐) a number from 1 to 7 to indicate your response. 1- Not at all; 2-To a very small extent ; 3-To a small extent; 4-To a moderate extent 5-To a fairly great extent ; 6-To a great extent ; 7- To a very great extent)*

Variables	Items
<b>Financial Perspective</b>	Our company's focusing on increasing revenue growth
	Our company's return on assets has been enhancing
	Our organisation is focusing on reducing cost per revenue unit
<b>Customer Perspective</b>	Our company is highlighting market share
	Our company has achieved a customer loyalty level
	Our company is considering customer complaints in an appropriate manner
<b>Internal Business Process</b>	Our company believes in delivering products and services to customers on time
	Our company is trying to maintain a sustainable relationship with local and international markets
	Our company is focusing on producing competitive products and services
<b>Learning and Growth</b>	Our company is trying to produce different categories of products
	Our company is the technological leader in the market
	Our company has the ability to compete globally
<b>Social and Environmental Measures</b>	Our company has a diversity of employees
	Our company is concerned about stakeholders participation in social and environmental affairs
	Our company is attempting to protect for natural resource and reducing emission levels

**Section 3. Sustainable Organisational Performance**

*The following items explore aspects of economic performance over the last five years. Please tick (☐) a number from 1 to 7 to indicate your response. 1- Not at all; 2-To a very small extent ; 3-To a small extent; 4-To a moderate extent 5-To a fairly great extent ; 6-To a great extent ; 7- To a very great extent)*  
*In your assessment, how has your company performed in the last five years concerning:*

Variable	Item
<b>Economic Performance</b>	Sales growth
	Operating income
	Return on investment (ROI)
	Return on equity (ROE)
	Increase in customer base
<b>Social Performance</b>	Prioritised employee health and safety
	Concerned about protecting the rights of original people or local community
	Considering the interests of our stakeholders
	Interested funding in a local community based on needs
	Communicated the firm's environmental impacts and risks to the public
<b>Environmental Performance</b>	Our company is conscious about decreasing energy consumption
	Our company is conscious of decreasing waste & emissions from industrial activities
	Our company is concerned with purchasing of non-renewable materials, chemicals and components
	This company is conscious of reducing the risk of environmental accidents, spills, and releases.
	This company is concerned with reducing environmental impacts by establishing partnerships