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IMPACT OF GREEN INTELLECTUAL CAPITAL ON ORGANIZATIONAL PERFORMANCE AND THE MEDIATING ROLE OF EMPLOYEE GREEN BEHAVIOUR: AN EMPIRICAL STUDY ON INDIAN ENERGY SECTOR

ABSTRACT

The study aims to examine how the dimensions of Green intellectual capital (GIC) are related to organizational performance (OP) with employee green behaviour (EGB) as a mediator. With the commonly discussed GIC components, the study considers green spiritual capital (GSpC) as another important dimension of GIC. Data was collected through a questionnaire survey from 169 organizational units operating in the energy-sector in India. Exploratory factor analysis supports the inclusion of GSpC in the construct of GIC. Confirmatory factor analysis validates the measurement model. Structural-equation-modeling using the Partial-Least-Squares method examined the hypothesized relations. Findings reveal that GIC dimensions have varying degrees of direct and indirect effects on OP through EGB. The study contributes to the existing literature by extending the understanding of GIC and its connection with EGB and OP using natural-resource-based theory and social cognitive theory. It highlights significant practical implications for improving a firm's operational efficiency and financial success.

Keywords: green intellectual capital, green human capital, green structural capital, green relational capital, employee green behaviour, organizational performance

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INTRODUCTION

In the contemporary knowledge-based economies, the significance of intellectual capital (IC) in influencing organizational performance in domains critical to their existence, such as financial performance (Xu and Wang, 2018; Zhang, Duc, Mutuk, and Tsai, 2021), business sustainability (Gross-Golacka, Kusterka-Jefmanska and Jefmanski, 2020; Olarewaju and Msomi, 2021; business performance (Chu, Chan, Yu, Ng, and Wong, 2011; Abdullah and Sofian, 2012), technology innovation performance (Verbano and Crema, 2016), and competitive advantage (Kamukama and Sulait, 2017) has already been well researched and highlighted. However, intellectual capital incorporating environmental concept which is known as green intellectual capital (GIC), has not received much attention until recently (Yusoff, Omar, Zaman, and Samad 2019; Nisar, Haider, Ali, Jamshed, Ryu, and Gill, 2021). Today, when sensitivity towards the natural environment has become an extensively discussed issue in the global economy, the contribution of GIC towards organizational performance cannot be disregarded by business organizations.

The term 'green intellectual capital' was coined by Chen (2008) who described GIC as 'intellectual capital about green innovation or environmental management' (p. 272). Scholars have recognized the contribution of GIC to organizational performance in terms of financial indicators (Chaudhury, 2016; Erinosa and Rahmawati, 2017), competitive gain (Chen, 2008; Chaudhury, 2016; Yahya, Arshad, and Kamaluddin, 2019), firm's environmental performance (Nisar et al., 2021), green management (Liu 2010) and sustainable excellence (Yusoff et al., 2019; Yusliza, Yong, Tanveer, Ramayah, Faezah, and Muhammad, 2020).

However, studies suggest that GIC may directly contribute to sustainability, but it is not equally related to all aspects of sustainable performance (i.e., economic, social and environmental) of the organization (Yusliza et al., 2020). Furthermore, different dimensions of GIC indicate varied strength when related to competitive advantage (Yahya et al., 2019), green product innovation (Delgado-Verde, Amores-Salvadó, Martín-de Castro, and Navas-López, 2014) and financial performance (Erinosa and Rahmawati, 2017). Importantly, Rehman, Kraus, Shah, Khanin, and Mahto (2021) have revealed that GIC does not directly contribute to environmental sustainability at all, its effect is mediated by green innovation. Undeniably, these findings are intriguing and the link between GIC and organizational performance demands further investigations.

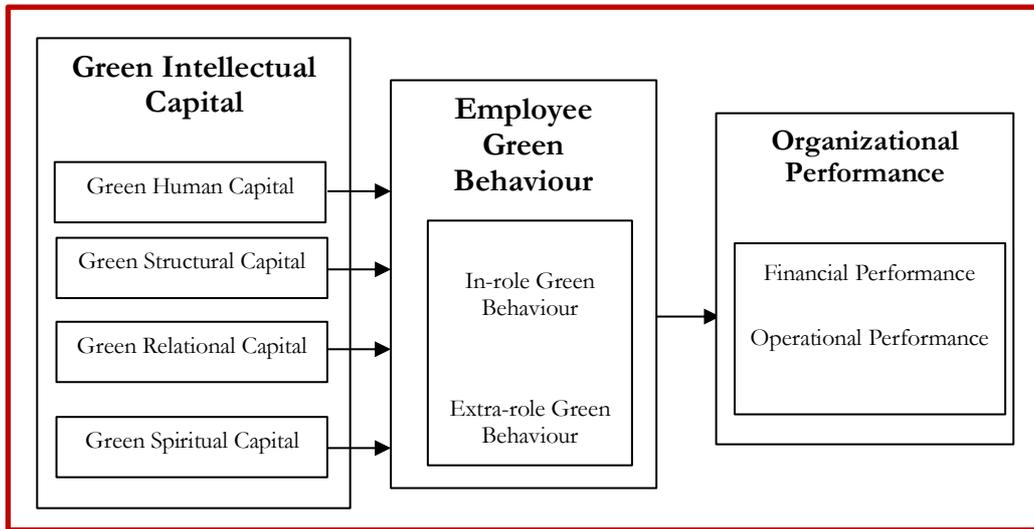
In contemporary research, along with GIC, scholarly interest in the topic of employee green behaviour (EGB) has also gained substantial impetus (Ojo, Tan and Alias, 2020; Al-Swidi, Gelaidan, and Saleh, 2021; Nisar et al., 2021). Employee green behaviour is the most critical success factor when it comes to organizations' environmentally sustainable business operations (Chaudhary, 2020; Nisar et al., 2021) and it would eventually ensure overall organizational performance obtaining first-mover advantages in eco-friendly business operations, enhancing the organization's green image and securing competitive advantages of business (Wu, Wei, Tseng, and Cheng, 2018; Kim, Kim, Choi, and Phetvaroon, 2019). Further, researchers have also indicated that different GIC dimensions (e.g., green human, relational and structural capital) can significantly lead to employee green behaviour (Adler and Kwon, 2002; Chen, 2008; Huang and Kung, 2011; Chang and Chen, 2012). Thus, we believe that the dimensions of GIC lead to employee green behaviour which can potentially

contribute to organizational performance by incorporating both financial and operational performance. Recently, Nisar et al. (2021) established that GIC as an overall construct can significantly contribute to employee pro-environmental behaviour which in turn leads to the environmental performance of the organization. However, there is no significant study to explore whether and how employee green behaviour can mediate the relation between GIC and overall organizational performance incorporating financial and operational dimensions.

In addition, the study has identified another important research gap regarding the dimensions of green intellectual capital. Using the popular analogy to IC, green intellectual capital is commonly classified into three components namely, green human capital (GHC); green structural (GSC) or organizational capital; and green relational capital (GRC) (Chen, 2008; Yusliza et al., 2020; Rehman et al, 2021). Interestingly, in a recent study, Ghosh and Haque, (2022) have classified GIC into green human capital (GHC), green structural capital (GSC), green relational capital (GRC) and green spiritual capital (GSpC) and have established that green spiritual capital is strongly related to superior employee green behaviour. As a dimension of IC, 'spiritual capital' is considered distinct from religious phenomenon (Vitell, King, Howie, Tot, Albert, Hidalgo, and Yacout, 2016), rather it has largely been defined as values including an individual's trust, faith, determination and emotion that provide a sense of purpose and ethics of service when it comes to follow organizational vision, direction, guidance and principles (Zohar and Marshall, 2004; Long and Mills, 2010). These qualities are essential for ensuring not only the individual level outcome but also organizational level performance. Thus, we conceptualize that green spiritual capital as an element of GIC can lead to significant value addition in regard to both employee green behaviour and organizational performance.

Addressing the above gaps, the study considers green spiritual capital as an important component of GIC and aims to examine its relevance along with GHC, GSC and GRC in influencing organizational performance with employee green behaviour as a mediator (Figure 1). Interestingly, the Indian energy sector constitutes the research context of this study. It is witnessed that the Indian economy has transformed remarkably over the past two decades (Ahmed and Ali, 2015). The energy sector of the country has played a key role in this increasing economic growth as this sector plays a vital role in influencing decision making in all the other important sections of the economy (IBEF, 2021). However, it is evident that while contributing to the economic growth and welfare of the nation, the sector leaves a serious catastrophic environmental impact (Kumar and Majid, 2020). Thus, this sector, in particular, calls for an urgent concerted focus on employee green behaviour to conduct business operations with eco-sensitivity. Moreover presently, the Indian energy sector is experiencing a transition from non-renewable energy technology to renewable energy sources (CEA, 2020) to minimize environmental degradation while counting the financial and operational success. In this context, the connections between the dimensions of GIC and employee green behaviour is extremely pertinent in ensuring the overall organizational performance of this sector.

Figure 1. Conceptual model



The study has three major research contributions. First, the study empirically explores an essential dimension of GIC in relation to organizational performance, namely green spiritual capital which remained largely unexplored in GIC literature. Second, it examines how the four dimensions of GIC (human, structural, relational and spiritual) can individually contribute to organizational performance by incorporating financial and operational performance. Third, the study conceptually connects each dimension of GIC understudy with organizational performance through the mediation of employee green behaviour (in-role and extra-role) and provides an empirical investigation for the same. Moreover, the existing literature has mainly investigated GIC in the context of developed economies (Yusliza et al., 2020). Hence, in addition, the study confirms and extends the results of past studies by providing a gateway for further exploration in this area, especially for a developing economy where the reporting, measurement, and management of GIC are all at their nascent stages.

LITERATURE REVIEW

Theoretical background

The study primarily refers to social cognitive theory (SCT) and natural resource-based view (NRBV) to explain the relationship of the dimensions of green intellectual capital with employee green behaviour and organizational performance. Social cognitive theory (Bandura, 1986) asserts that self-efficacy, personal agency, employee's intention and emotion to engage in a particular behaviour and perceptual interpretations of contextual factors are important in generating positive employee behaviour. Dimensions of GIC refer to employee's knowledge, skill, experience (GHC), green values (GSpC), organizational relations (GRC) and supportive contextual facilities (GSC) regarding environmental sustainability. Thus, the components of GIC can instigate employee green behavior by developing green capacities (personal-agency), promoting assertive belief regarding green

ability and greening (self-efficacy), enhancing willingness for green goal-setting and providing contextual facilitation for greening (Singh, Del Giudice, Chierici, and Graziano, 2020; Nisar et al., 2021). In addition, supporting the Behavioural-Engineering model (Gilbert, 1978), we argue that apart from incentives and instruments, individual green behaviour is conditioned by related knowledge, capacity, motive and information. Thus, a persuasive association between employee green behaviour and green intellectual capital is also explicit.

Advancing the natural resource-based view (Hart, 1995), we believe that green intellectual capital fulfills VRIN (valuable, rare, imperfectly imitable, non-substitutable) criteria (Bontis, 1998; Barney, 2001) that improves organizational performance by ensuring environmentally sustainable economic activity (Yusliza et al., 2020) and leads to the competitive advantage of the firm (Chen, 2008). Moreover, components of GIC enhance organizational performance by facilitating green innovation or GI (Chang and Chen, 2012; Rehman et al., 2021) and employee green behaviour (Nisar et al., 2021). Both GI and EGB are important for creating products based on green-design principles, mitigating environmental footprints of organizational operational processes, saving cost, enhancing the firm's market orientation, improving the green image and optimizing resource usage (Chen et al., 2014; Singh et al., 2020; Rehman et al., 2021). Hence, we argue that GIC components can positively contribute to an organization's financial and operational performance.

Green intellectual capital and its components

Chang and Chen (2012: 77), asserts that GIC is “the total stock of all kinds of intangible assets, knowledge, capabilities, and relationships, etc. about environmental protection or green innovation at the individual level and the organization level within a company”. Chen (2008), who introduced the concept of GIC, referred to the classification of intellectual capital adopted by Johnson (1999) and Bontis (1999) to categorize GIC into green human capital (GHC), green structural capital (GSC) and green relational capital (GRC). Later, this classification has been extensively adopted and accepted by various authors (Yusliza et al., 2020; Rehman et al., 2021).

Green human capital (GHC) includes the entire knowledge, skills, innovation, experience and capabilities of employees about environmental conservation or green management (Chen 2008, Huang and Kung, 2011; Chang and Chen 2012). Unlike GHC, green structural capital (GSC) is embedded in the organizational architecture. GSC is defined as the stock of organizational capabilities, operational processes, managerial philosophies, organizational culture, knowledge management systems, reward systems, information technology systems, databases, managerial mechanisms etc. regarding environmental conservation (Chen, 2008). Green relational capital is defined as the stock of a company's interactive relationships with its key stakeholders such as customers, suppliers, and partners regarding environmental management and green innovation (Chen, 2008).

Importantly, spiritual capital is a relatively new concept that has emerged from the core concept of intellectual capital (Zohar and Marshall, 2004) and scholars have advocated the inclusion of spiritual capital as one of the main components of intellectual capital in the organizational setting (Abdullah and Sofian, 2012; Khaliq, Shaari, Isa, and Samad, 2013; Khan, 2014). Zohar and Marshall (2004) were the pioneers to use the expression ‘spiritual

intelligence' and they described spiritual capital as intangible wealth 'that nourishes and sustains human spirit' (p. 538).

Although many scholars consider spiritual capital as a religious dogma resulting from social capital (Montemaggi, 2010), it is noteworthy to mention that spirituality at work may not necessarily be associated with religion. According to Mitroff (2003), spirituality in the workplace is tolerant, inclusive and open-minded, unlike religion which refers to formal structure of belief that differentiate people. MacKenna (2009) and Kourie (2006) concluded that from a post-patriarchal and telluric contemporary research approach, the conceptualization of spirituality is considered to rest in the ontology of values. In line with Moghadam and Makvand (2019), in this study, spiritual capital is proposed to be distinct from religion and to fundamentally include intangible wealth which is value-focused and specifically linked with the spirituality construct.

As a component of IC, spiritual capital is linked with optimization of resources (Gràcia, 2012), innovation and performance (Neubert, Bradley, Ardianti, and Simiyu, 2017) organizational citizenship behaviours (Moghadam and Makvand, 2019) and job performance of employees (Badakhshani, 2017). Moreover, spiritual capital is important to boost the enrichment of all the other capacities in an integrated way (Gràcia, 2012) and thus researches are being directed towards spiritual capital in improving performance (Abdullah and Sofian, 2012; Mahadevan, 2013; Moghadam and Makvand, 2019). However, no studies have focused on spiritual capital about green innovation or environmental management to examine its impact on organizational performance. Hence, the study investigates green spiritual capital which is likely to be the fundamental driving force for individual commitment toward green behaviour and eventually towards organizational performance.

Employee green behaviour

Employee green behaviour refers to "scalable actions and behaviours that employees engage in or bring about that are linked with, and contribute to, environmental sustainability" (Ones and Dilchert, 2012: 87) and can be classified into following five categories, such as, (1) avoiding harm, e.g., mitigating environmental pollution, (2) conserving, e.g., reducing use, recycling (3) working sustainability, e.g., changing how work is done, (4) influencing others, e.g., encouraging, supporting, educating others to behave 'green' and (5) taking initiative, e.g., lobbying and activism (Ones and Dilchert, 2012).

Later, researchers have more comprehensively explained the taxonomy of EGB with two categories, such as, (1) in-role or required green behaviour and (2) extra-role or voluntary or contextual green behaviour (Ramus and Killmer, 2007; Norton, Parker, Zacher, and Ashkanasy, 2015). In-role green behaviour is a set of green formal tasks (e.g., disposal of hazardous materials in accordance with organizational and governmental waste management mandates) that are essential for employee performance assessment. Whereas extra-role green behaviour is voluntary or informal green behaviours (e.g., shutting down laptops, turning off lights when not in use) and are based on personal initiatives regarding 'greening' and exceeding the organization's expectation (Norton et al., 2015). Werner (2000) proposed to "broaden the individual performance construct" (p. 6) to include both task/in-role and contextual/extra-role behaviour in effective performance management to address changing nature of job and skill portfolios. Both in-role and extra-role green behaviours can

play an important role in attaining organizational sustainability (Norton et al., 2015, Nisar et al., 2021). Our study has included both these behaviours to measure employee green behaviour (Bissing-Olson, Iyer, Fielding, and Zacher, 2013).

Organizational performance

According to Ho (2011) organizational performance refers to how well an organization can meet its own needs and the needs of its stakeholders leading to survival. Organizational performance is considered to be the focal theme in business at any point in time.

Traditionally organizational performance includes financial measures of performance (Mishra and Mohanty, 2014). However, contemporary research suggests that organizational performance must include non-financial measures as well (Rehman et al., 2019) because the financial indicators only form “the narrowest conception of business performance” (Richter, Schmidt, Ladwig, and Wulhorst, 2017: 95-96). Generally, quality, operation, efficiency, and profitability are considered equally vital factors to ensure the overall success of an organization (Othman and Abdullah, 2016). Significantly, Wang et al. (2014), exploring the relationship between IC and organizational performance, proposed financial and operational performance as two important dimensions defining organizational performance which was subsequently adopted and accepted by other studies (Richter et al., 2017; Gabriela, 2020).

Financial performance is generally reflected by economic and market indicators (Luo, Huang and Wang, 2012) and mainly include return on assets (ROA), return on equity (ROE), return on sales, earning per share, etc. (Hernaus, Bach, and Vuksic, 2012; Mishra and Mohanty, 2014). On the other hand, a firm’s operational performance is non-financial aspects related to the organization’s social and societal relationships and competitive success factors that influence the efficiency of its operations (Luo et al., 2012). It is generally related to the outcome of organizational processes, internal operations, product quality and customer satisfaction (Fang, Terziovski, and Samson, 2008; Manikas and Terry, 2010). Undoubtedly, “operational indicators focus on those key determinants of success that might lead to financial performance” (Richter et al., 2017: 96). This study has used both the dimensions of operational and financial performance to measure organizational performance as proposed by Wang et al. (2014).

Hypotheses development

Components of GIC and organizational performance

In line with the natural resource-based view, dimensions of green intellectual capital are crucial for organizational performance because they create value for the organization. There is substantial research evidence that GHC, GSC and GRC are positively related to a firm’s competitive advantage (Chen, 2008; Firmansyah, 2017; Yahya et al., 2019) and financial performance (Erinos and Rahmawati, 2017). GHC refers to human skill, knowledge and creativity regarding ‘greening’ and can improve a firm’s competitiveness (Chen, 2008; Yahya et al., 2019) and business performance (Yong et al., 2019) by enhancing individual job performance (Nisar et al., 2021), ensuring green innovation outcomes (Chen and Chang, 2012) and reducing wastage (Malik, Cao, Mughal, Kundi, Mughal, and Ramayah, 2020).

In addition, both GRC and GSC have a positive association with business sustainability (Yusoff et al., 2019). GRC can enhance business orientation (Martini, Corvino, Doni, and

Rigolini, 2016) and green product innovation (Delgado-Verde et al., 2014). Importantly, Coraputo, Pironti, Doni, and Martini (2019) found that in middle-sized firms, relational capital positively contributes to a firm's performance by reducing the cost of goods sold and interest expenses and eventually increasing earnings per share. In today's world, business performance highly depends on green structural capital (Yusoff et al., 2019) as it supports firms to improve products and processes by providing updated technological support for green innovation. GSC increases firm's capability in addressing green challenges and considerably improves sales and reduces cost (Yusoff et al., 2019).

Previous studies revealed that companies' spiritual capital has a direct and strong association with the job performance of employees (Badakhshani, 2017; Moghadam and Makvand, 2019) and superior organizational performance (Abdullah and Sofian, 2012). Spiritual capital makes employees aware of their intrinsic capacities, facilitates identification of potentials embedded in their surroundings, increase the ability to visualize issues and problems from varied approaches, enables empathetic gesture towards other fellow beings and be honest in living an integrated life without harming the existence of other communities, enhances the capability of converting threats into opportunities and having a win-win approach in all levels of life (Mitroff and Denton, 1999; Ashmos and Duchon, 2000; Zohar and Marshall, 2004). Studies revealed that entrepreneurs' spiritual capital has a significant positive influence on organizational innovation, employment and total sales (Neubert et al., 2017).

Based on the above discussion, we argue that GHC, GSC, GRC and GSpC can improve organizational performance and thus the study hypothesizes the following

Hypothesis 1a: Green human capital (GHC) has a significant and positive influence on organizational performance (OP).

Hypothesis 1b: Green structural capital (GSC) has a significant and positive influence on organizational performance (OP).

Hypothesis 1c: Green relational capital (GRC) has a significant and positive influence on organizational performance (OP).

Hypothesis 1d: Green spiritual capital (GSpC) has a significant and positive influence on organizational performance (OP).

Components of GIC and employee green behaviour

It is evident that intangible assets (human, social organizational or structural) lead employees to organizational citizenship behaviour (Tefera and Hunsaker, 2020). GIC dimensions constitute a unique criterion for improving the environment-friendly behaviour of employees. Green human capital helps employees to enhance job efficiency, reduce decision-making errors, improve their quality of work, and achieve better performance regarding 'greening' (Nisar et al., 2021). GRC motivates employees to improve green behaviour without much managerial intervention (Adler and Kwon, 2002). A number of scholars have indicated that GHC and GSC complement each other in shaping employee green behaviour (Chen, 2008, Huang and Kung, 2011, Chang and Chen, 2012). In addition, both GSC and GRC are positively related to environmental competence and a sense of commitment (Huang and Kung, 2011) toward environmental sustainability leading to employee's green behaviour.

Previous studies revealed that companies' spiritual capital has a direct and strong association with organizational citizenship behaviours (Moghadam and Makvand, 2019). Spiritual capital helps employee to logically comprehend how their behavioural processes can have a significant impact on the present and future lives of others who have direct or indirect connections with them (Moghadam and Makvand, 2019). These qualities are highly important for employees to understand the pressing environmental issues and find a way out for minimizing the negative impact of human activities on environment leading to better societal well-being while generating profit. Thus, we believe that GHC, GSC, GRC and GSpC can positively influence employee green behaviour and draw the following hypotheses:

Hypothesis 2a: Green human capital (GHC) has a significant and positive influence on employee green behaviour (EGB).

Hypothesis 2b: Green structural capital (GSC) has a significant and positive influence on employee green behaviour (EGB).

Hypothesis 2c: Green relational capital (GRC) has a significant and positive influence on employee green behaviour (EGB).

Hypothesis 2d: Green spiritual capital (GSpC) has a significant and positive influence on employee green behaviour (EGB).

Employee green behaviour and organizational performance

Employee green behaviour directly or indirectly contributes to organizational sustainability (Ones and Dilchert, 2012). Nevertheless, researchers found that EGB directly leads to the sustainable environmental performance of the organization (Ojo et al., 2020; Al-Swidi et al., 2020) as well as it can also improve overall job performance (Norton et al., 2015; Ones and Dilchert, 2012) and contributes towards firm's economic performance (Chiu, Lin and Wang, 2017). Consistently, firm's performance mainly depends on employees who are directly responsible for conducting the operational processes (Ojo et al., 2020). In-role green behaviour contributes to core business goals (Norton et al., 2015). EGB encourages green innovation (Cai et al., 2020) which improves products and operational efficiency creating value, uniqueness, attractiveness and novelty for consumers. Moreover, voluntary green behaviour improves firm's work environment, enhances employee motivation and increases employee satisfaction (Kim, Kim, and Han, 2019b) which obviously leads to improved performance both at individual and organizational level. Thus, we argue that EGB contributes to both the financial and operational performance of the firm leading to overall organizational performance. Hence, the study hypothesizes:

Hypothesis 3: Employee green behaviour (EGB) has a significant and positive influence on organizational performance (OP).

Mediating effect of employee green behaviour

Organizational performance does not come directly from applying strategies, policies or practices; rather it depends on employee efforts (Morrison, 1996). Recent studies have focused on employee green behaviour as a mediator between organizational strategies and organizational outcome (Kim et al., 2019b; Nisar et al., 2021). In the modern business world, components of GIC are being strategically used to meet high customer demands with regard to environmental responsiveness, in improving the firm's green image, gaining competitive

advantage (Chen, Liu, and Kweh, 2014; Murga-Menoyo, 2014) and eventually creating value for the organization (Huang and Kung, 2011)

Extant literature supports the argument that components of GIC can be utilized to stimulate employee green behaviour (Yusliza et al., 2020; Nisar et al., 2021) and employee green behaviour leads to sustainable organizational performance (Chen et al., 2015; Yusliza et al., 2020). When employees are engaged in in-role green behaviour, they efficiently contribute to core business objectives (Norton et al., 2015). On the other hand, when they are engaged in extra-role green behaviour, they go beyond the formal role requirements and put forth extra efforts to support organizational policies and activities (Norton et al., 2015). Such situations lead to the successful achievement of organizational strategies and eventually enhance organization performance (Messersmith, Patel, Lepak, and Gould-Williams, 2011; Nisar et al., 2021). Based on this discussion, we assume that components of GIC would better predict organizational performance through the mediation of employee green behaviour. Therefore, the study draws the following hypotheses:

Hypothesis 4a: Employee green behaviour positively mediates the relation between green human capital (GHC) and organizational performance (OP).

Hypothesis 4b: Employee green behaviour positively mediates the relation between green structural capital (GSC) and organizational performance (OP).

Hypothesis 4c: Employee green behaviour positively mediates the relation between green relational capital (GRC) and organizational performance (OP).

Hypothesis 4d: Employee green behaviour positively mediates the relation between green spiritual capital (GSpC) and organizational performance (OP).

RESEARCH METHODOLOGY

Research instrument

The study collected data through a survey questionnaire designed with reference to extant research studies in the domain. The final version of the questionnaire was developed after a preliminary screening with the assistance of four academicians and eight industry-professionals. The final questionnaire consisted of three different sections, first explaining the purpose of research, second designed to capture respondents' demographic information and third covering the measurement items for the variables under study. A 5-point Likert scale, ranging from (1) strongly disagree to (5) strongly agree was used to collect responses as it is less confusing and increases the response rate (Babakus and Mangold, 1992).

Research population, sample and data collection

Organizations in the energy sector of India constituted the population for this research. As we know Indian energy sector is one of the most diversified sectors in the world that covers a large variety of activities related to the production and sale of energy (IBEF, 2021). The organizations have different types of power plants, refineries transmission and distribution centres with independent operating units in different states of India to conduct this wide array of activities. Such individual operating units are the units for study in this research. As the conceptualization of green intellectual capital is in the nascent phase in India, the purposive sampling technique was used after conducting several preliminary investigative discussions and informal interviews. Finally, 259 units were identified, each unit with at least

100 workers or employees and only one individual from each unit was selected to complete the questionnaire. A total of 258 questionnaires were distributed and the study received 169 completely filled up questionnaires yielding a response rate of approximately 65.50%.

Measures

The study measured GHC (five items), GSC (nine items) and GRC (five items) following the scale postulated by Chen (2008). We referred to the extant literature on spiritual capital (Zohar, and Marshall, 2004; Rego and Cunha, 2008; Ghosh and Haque, 2022) to define GSpC as a stock of intrinsic values including motivation, ethics, integrity, enthusiasm and a sense of joy and fulfilment related to environmental management. In this study the measurement of GSpC comprises the following six items: (1) Whether the employees are willing to sacrifice their self-interests for the benefit of the environment, (2) Whether the employees behave in a green way because of eco-consciousness rather than regulations, (3) Whether the employees are always ready to do something positive to environmental protection and sustainability, (4) Whether the employees consider protecting environment and doing the best to compensate its damage is the best way to help mankind, (5) Whether the employees maintain integrity to prevent environmental degradation and pollution to the best possible level and (6) Whether the employees derive personal joy and satisfaction protecting and preserving nature and natural resources.

Employee green behaviour was used as an overall construct including two dimensions (in-role and extra-role green behaviour). It was measured using six items as suggested by Bissing-Olson et al. (2013). The organizational performance included two dimensions (financial and operational performance) and was measured as an overall construct using eleven items following Wang et al. (2014).

Statistical analysis

First, EFA (exploratory factor analysis) has been conducted to identify the items for GSpC and to validate the inclusion of GSpC in the construct of GIC. Later, CFA (confirmatory factor analysis) was used to validate the measurement model by confirming composite reliability, average variance explained and discriminant validity. The partial least square PLS-SEM, a popular method for examining both simple and complex frameworks, is more appropriate for studies having a small sample size as recommended by Hair, Hult, Ringle and Sarstedt (2014). Hence the present study with a total sample-size of 169 has conducted PLS-SEM for testing and validating the hypotheses.

Results

Demographic profile

The study got fully completed questionnaires by a total of 169 respondents of whom approximately 15.38% were women and 84.61% were men. Approximately 23.66%, 56.80% and 19.53% of the respondents were having 5 to 10 years, above 10 to 15 years and above 15 years of work experience respectively. Respondents belonged to the organizations of which 69.23% were with 100-150 employees while 30.76% were operating with more than 150 employees.

Reliability

The internal consistency of the scale has been measured using the reliability test Cronbach's alpha (Table 1). This statistic ranges from 0.864 to 0.941 (all higher than 0.7) indicating a very good internal consistency (Hair et al., 2014).

Table 1. Cronbach's alpha value for constructs

GHC	GSC	GRC	GSpC	EGB	OP
0.941	0.924	0.902	0.864	0.885	0.936

Exploratory Factor Analysis (EFA)

Two EFA were conducted using promax rotation with eigenvalues greater than 1 to establish the items of the novel construct, GSpC and to examine its inclusion as a dimension of GIC (Table 2). It is an oblique rotation that allows for correlation and thus is suitable for our variables which are related. The first EFA identified a clear-cut pattern indicating the factor-item structures for GHC, GSC, GRC and GSpC with respective factor loadings. The accumulated variance explained by the items ranges from approximately 68.18% to 78.92% in the constructs. The second EFA identified a four-factor structure for GIC constituting GHC, GSpC, GRC and GSC explaining approximately 70.36% of the total variance.

The Kaiser-Meyer-Olkin (KMO) index values for these tests are greater than 0.8 (0.889 and 0.824 respectively) and Bartlett's tests are also significant at 0.01 level confirming the data to be appropriate for analysis.

Table 2. Exploratory factor analysis

First EFA Construct	Second EFA	Item	Promax-rotated loading factors					Accumulated Variance Explained
			GHC	GSC	GRC	GSpC	GIC	
GHC		GHC1	0.915					68.18%
		GHC2	0.924					
		GHC3	0.939					
		GHC4	0.874					
		GHC5	0.886					
GSC		GSC1		0.817				71.15%
		GSC2		0.909				
		GSC3		0.887				
		GSC4		0.873				
		GSC5		0.837				
		GSC6		0.829				
		GSC7		0.842				
		GSC8		0.875				
		GSC9		0.931				
GRC		GRC1			0.832			74.21%
		GRC2			0.947			
		GRC3			0.924			
		GRC4			0.878			
		GRC5			0.847			
GSpC		GSpC1				0.916		78.92%
		GSpC2				0.882		
		GSpC3				0.955		
		GSpC4				0.947		
		GSpC5				0.926		
		GSpC6				0.933		
GIC		GHC					0.908	70.36%
		GSC					0.828	
		GRC					0.877	
		GSpC					0.892	

Note: KMO for first EFA is .889** and second EFA is .824** (**Bartlett's tests significant at 0.01 level)

Confirmatory Factor Analysis (CFA)

The model included a second order factor for employee green behaviour and organizational performance. EGB includes in-role and extra-role green behaviours while organizational performance includes financial performance and operational performance. Thus, the validity and reliability of first order, followed by second order were tested (Table 3).

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Table 3. Confirmatory factor analysis

First Order	Second order	Items	Factor Loadings	CR	AVE
GHC		GHC1	0.819	0.913	0.679
		GHC2	0.879		
		GHC3	0.878		
		GHC4	0.772		
		GHC5	0.766		
GSC		GSC1	0.753	0.946	0.662
		GSC2	0.834		
		GSC3	0.833		
		GSC4	0.831		
		GSC5	0.811		
		GSC6	0.822		
		GSC7	0.781		
		GSC8	0.775		
		GSC9	0.876		
GRC		GRC1	0.758	0.887	0.611
		GRC2	0.811		
		GRC3	0.815		
		GRC4	0.786		
		GRC5	0.738		
GSpC		GSpC1	0.863	0.942	0.768
		GSpC2	0.789		
		GSpC3	0.925		
		GSpC4	0.919		
		GSpC5	0.879		
		GSpC6	0.853		
InGB		InGB1	0.768	0.870	0.691
		InGB2	0.842		
		InGB3	0.881		
ExGB		ExGB1	0.758	0.818	0.601
		ExGB2	0.721		
		ExGB3	0.842		
EGB		InGB	0.878	0.857	0.750
		ExGB	0.855		
FP		FP1	0.862	0.939	0.720
		FP2	0.865		
		FP3	0.852		
		FP4	0.742		
		FP5	0.912		
		FP6	0.852		
OeP		OeP1	0.757	0.903	0.652
		OeP1	0.835		
		OeP2	0.917		
		OeP3	0.757		
		OeP5	0.762		
OP		FP	0.845	0.814	0.686
		OeP	0.812		

Both the first order and second order factors showed loadings of more than 0.7, the AVE values of all constructs are above 0.5 and the CR values of all constructs are higher than 0.7. Thus, the results confirm the convergent validity of all the measures under study (Hair, Hult, Ringle, and Sarstedt, 2017).

The discriminant validity was computed using the heterotrait-monotrait ratio (HTMT) of correlation (Henseler, Ringle, and Sarstedt, 2015). Table 4 shows that all HTMT ratios are lower than the most restrictive threshold of 0.85, determining good discriminant validity properties.

Common method bias

Kock (2015) suggested detecting common method bias through a full Collinearity assessment approach for PLS-SEM. Full Collinearity VIF values for all constructs (Table 4) are less than 3.3 indicating that the model is not affected by common method bias (Kock, 2015; Hair et al., 2017).

Table 4. Full collinearity VIF and Discriminant validity (HTMT Ratio)

Constructs	VIF	1	2	3	4	5	6
GHC	2.5569						
GSC	2.3389	0.616					
GRC	2.2044	0.658	0.578				
GSpC	2.8991	0.712	0.686	0.654			
EGB	1.9006	0.568	0.441	0.483	0.572		
OP	1.9314	0.447	0.217	0.419	0.492	0.622	

Structural model

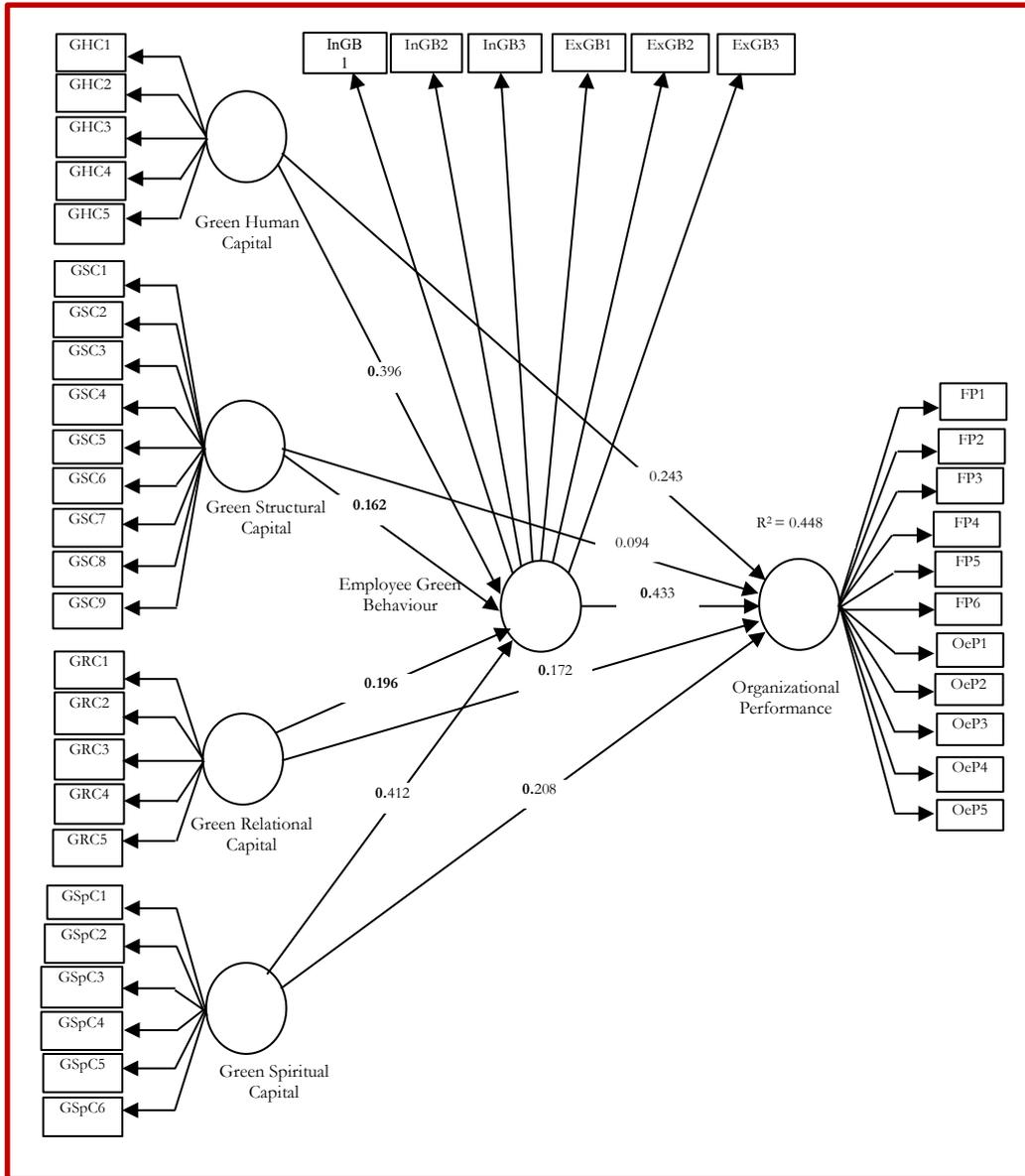
The structural model (Figure 2) represents the hypothesized relationship among the constructs. The study examined the R² value, to check the amount of variance in organizational performance that can be explained by the exogenous constructs under study (Hair et al., 2017). The R² for OP is 0.448 indicating that GHC, GSC, GRC, GSpC and EGB can explain approximately 44% variance in OP.

The findings shows (Table 5) that three dimensions of GIC, namely GHC ($\beta=0.243$, $p\leq 0.01$, $t\text{-value}=3.626$), GRC ($\beta=0.172$, $p\leq 0.05$, $t\text{-value}=2.205$) and GSpC ($\beta=0.208$, $p\leq 0.01$, $t\text{-value}=3.301$) have significant positive relation with organization performance (OP). However, the relation between GSC ($\beta=0.094$, $p > 0.05$, $t\text{-value}=1.3055$) and organization performance is not significant. Thus Hypothesis 1a, Hypothesis 1c and Hypothesis 1d are accepted and Hypothesis 1b is rejected.

The study also establishes (Table 5) that all dimensions of GIC, namely GHC ($\beta=0.396$, $p\leq 0.01$, $t\text{-value}=5.0769$), GSC ($\beta=0.162$, $p\leq 0.05$, $t\text{-value}=2.4923$), GRC ($\beta=0.196$, $p\leq 0.01$, $t\text{-value}=2.8823$) and GSpC ($\beta=0.412$, $p\leq 0.01$, $t\text{-value}=5.9710$) have significant positive relation with employee green behaviour (EGB). Thus Hypothesis 2a, Hypothesis 2b, Hypothesis 2c and Hypothesis 2d all are supported.

Results confirm that employee green behaviour ($\beta=0.433$, $p\leq 0.01$, $t\text{-value}=8.326$) significantly and positively affects organizational performance. Thus, Hypothesis 3 is accepted.

Figure 2. Structural model



f^2 value indicates whether exogenous variables have a small ($f^2 \Rightarrow 0.02$), medium ($f^2 \Rightarrow 0.15$) or large effect ($f^2 \Rightarrow 0.35$) on the endogenous variable (Cohen, 1998). Table 5 shows that EGB ($f^2 = 0.414$) has a large level of effect on OP. Though GSC ($f^2 = 0.016$) has no effect on organizational performance, it has ($f^2 = 0.115$) a small effect on EGB. Results show that GRC has small effect ($f^2 = 0.072$) on OP and moderate effect ($f^2 = 0.210$)

on EGB. Both GHC ($f^2 = 0.269$) and GSpC ($f^2 = 0.226$) have medium level of effect on OP and large level of effect ($f^2 = 0.378$ and $f^2 = 0.398$ respectively) on EGB.

Table 5. Path coefficients and hypothesis testing

Hypotheses	Hypotheses Paths	β value	T-values	f^2	Results
Hypothesis 1a	GHC \square OP	0.243	3.6268	0.269	Accepted***
Hypothesis 1b	GSC \square OP	0.094	1.3055	0.016	Rejected*
Hypothesis 1c	GRC \square OP	0.172	2.2051	0.072	Accepted**
Hypothesis 1d	GSpC \square OP	0.208	3.3015	0.226	Accepted***
Hypothesis 2a	GHC \square EGB	0.396	5.0769	0.378	Accepted***
Hypothesis 2b	GSC \square EGB	0.162	2.4923	0.115	Accepted**
Hypothesis 2c	GRC \square EGB	0.196	2.8823	0.210	Accepted***
Hypothesis 2d	GSpC \square EGB	0.412	5.9710	0.398	Accepted***
Hypothesis 3	EGB \square OP	0.433	8.3269	0.414	Accepted***

Note: Critical t-values for a two-tailed test are: <1.96 ($p > .05^*$), 1.96 ($p = .05^{**}$), and 2.58 ($p = .001^{***}$)

Mediating effect of employee green behaviour

As suggested by Preacher and Hayes (2008), if the confidence interval of indirect effect does not straddle at 0, then significant mediation exists. As shown in Table 6 the mediating effect of employee green behaviour is found to be significant and positive between GHC and OP ($\beta=0.171$, $p<=0.01$, $t\text{-value}=4.512$), GSC and OP ($\beta=0.070$, $p<=0.05$, $t\text{-value}=2.125$), GRC and OP ($\beta=0.084$, $p<=0.05$, $t\text{-value}=2.069$) and finally between GSpC and OP ($\beta=0.178$, $p<=0.01$, $t\text{-value}=7.433$). The 95% bias-corrected bootstrap confidence interval also does not show any interval straddling at 0. Thus Hypothesis 4a, Hypothesis 4b, Hypothesis 4c and Hypothesis 4d all are supported.

Table 6. Hypothesis testing of the mediation

Hypotheses	Hypotheses Paths	Confidence Interval (BC)				Results
		β value	T-value	LL	UL	
Hypothesis 4a	GHC \square EGB \square OP	0.171	4.5123	0.218	0.561	Accepted***
Hypothesis 4b	GSC \square EGB \square OP	0.070	2.1256	0.265	0.406	Accepted**
Hypothesis 4c	GRC \square EGB \square OP	0.084	2.0699	0.261	0.430	Accepted**
Hypothesis 4d	GSpC \square EGB \square OP	0.178	7.4331	0.197	0.554	Accepted***

Note: Critical t-values for a two-tailed test are: <1.96 ($p > .05^*$), 1.96 ($p = .05^{**}$), and 2.58 ($p = .001^{***}$)

DISCUSSION AND IMPLICATIONS

This empirical study exploits the advantage of adopting green strategies such as GIC and examines how the components of green intellectual capital contribute towards organizational performance in the context of the Indian energy sector considering the mediating role of employee green behaviour. Results are consistent with previous scholars' findings that GIC can significantly contribute to both employee green behaviour (Nisar et al, 2021) and organizational outcome (Yusliza et al., 2020). However, both the studies (Nisar et al, 2021 and Yusliza et al., 2020) have focused on GIC as an overall construct, while our study reveals how individual components of GIC would impact EGB and organizational performance in a certain way with varying degrees. Importantly, another study (Yusoff et al, 2019) examined the impact of individual components of GIC (GHC, GSC, GRC) on business sustainability incorporating financial, environmental and social performance, however, the model does not include employee green behaviour as a mediator. Thus, our study extends the GIC literature by highlighting the importance of employee green behaviour in exploring the contribution of individual components of GIC (GHC, GSC, GRC, GSpC) towards organizational performance (financial and operational).

As the results reveal, among all the dimensions of GIC, green human capital and green spiritual capital are found to be the most important factors for both employee green behaviour and organizational performance. Thus, the findings support the previous studies that claimed that the 'human' expertise and spiritual capital seems to be the most significant components in the application of other capitals (Massaro, Dumay, Garlatti, and Dal-Mas, 2018; Gràcia, 2012) and as such they are the most crucial elements in achieving sustainability (Massaro et al., 2018).

The study found that three dimensions of GIC (e.g., GHC, GRC and GSpC) both directly and through the mediation of green behaviour contribute to organizational performance. However, GSC can contribute towards organizational performance only through the mediation of employee green behaviour. It does not directly influence organizational performance. This finding contradicts Yusoff et al. (2019) and a few others (Chen, 2008) who found GSC contributing importantly to organizational outcomes. This difference could be due to the fact that GIC in India is still in an emerging phase and organizations are in the process of installation of the structural support for environment-friendly economic activities and presently it depends purely on employees' individual initiatives and efforts. As structural capital is grossly embedded in organizational framework, organizations need to seriously contemplate implementing GSC directives to operate beyond mere legal compulsion to produce results in terms of organizational performance.

Theoretical implications

The study offers significant theoretical contributions. First, this study is a valuable addition to the GIC literature as it provides a deeper understanding of the connections among the GIC components, employee green behaviour and organizational performance from the social cognitive theory (SCT) perspective and natural resource-based view (NRBV). SCT refers to individual, environment and behavior. Our study refers to this theory to analyze the association between individual GIC components and employee green behaviour through the conceptual inferences of personal agency, goals, self-efficacy, and perceptions

towards contextual facilities. The result is also in congruence with the Behavioural-Engineering model (Gilbert, 1978) that explains how individual behaviour can be conditioned by required motive and capability. Again, in line with NRBV, the study established that if employees are conscious about their environment and have environment related knowledge, skills, abilities, values, attitude and structural support, they can better participate in environment-friendly activities which in turn tends to enhance firm's financial and operational performance.

Second, the study introduces a new theoretical lens in the management field by shedding light on the GIC concept in the emerging economy of India where the concept of GIC is in its early emergent phase.

The third noteworthy contribution refers to the exploration of a largely unexplored value-driven dimension of GIC, called green spiritual capital, in relation with EGB and organizational performance. Though prior studies indicated that along with related knowledge and competencies, GIC may also include values, willingness and attitude toward greening, as EGB can necessarily be conditioned by these factors (Kim et al., 2019b; Nisar et al., 2021; Ghosh and Haque, 2022). Our study reveals how green spiritual capital can better predict EGB by upholding employee spirit for greening and how it can give impetus to sustainable business performance incorporating a win-win approach (Zohar and Marshall, 2004).

Practical implications

The study opens up a new avenue for business organizations in achieving organizational excellence in an eco-sensitive manner, particularly for the energy sector organizations that play a key role in almost every country's economy. However, this sector is extremely pollution-prone (Kumar and Majid, 2020). Presently nearly 74% of the energy demand of India is supplied by coal and oil, where the sources of energy production such as coal, oil and natural gas are responsible for one-third of global greenhouse gas emissions (Kumar and Majid, 2020). Thus, ensuring organizations' performance with minimum environmental impact is an urgent need as well as a real challenge for such organizations. Therefore, the findings of the study are highly relevant to the policy makers and aid the decision-making process of such firms. Organizations need to utilize managerial functions strategically to create, accumulate and recreate different dimensions of green intellectual capital by acquiring and retaining employees with environment-orientation and a positive mindset towards greening, organizing regular training programmes regarding green practices and providing opportunities to implement green learning and creativity. Organizations must deploy the GIC components in encouraging employee green behaviour and thereby ensuring improved financial and operational performance leading toward environmental-sustainable growth. The study also provides insight into the real scenario and suggests that the structural support in conducting business in an eco-friendly manner must not be restricted only to legal compliance. Otherwise, the full potential of green intellectual capital may not be realized.

CONCLUSION AND LIMITATIONS

Improved performance of business organizations is particularly imperative for a developing country to progress and prosper. This study has contributed to the existing body of knowledge in achieving a higher level of organizational performance in energy sector organizations by deploying various components of green intellectual capital and thereby fostering employee green behaviour. It provides a comprehensive understanding of the association among GIC, EGB and organizational performance by connecting the hypothesized relations with two theories, namely, Natural-resource based view (Hart, 1995) and Social cognitive theory (Bandura, 1986).

However, the study is not free from limitations. First, the research was conducted in the context of a developing country; hence generalization and validation of the findings may be restricted to a certain extent. Second, it collected data from a particular sector. In the future, a cross sectional study may provide a better understanding of how GIC dimensions may contribute to organizations operating in different sectors.

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