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The Mediating Role of Green Information Systems in the Relationship Between Green Supplier-Customer Knowledge and Organisational Green Performance: An Empirical Analysis in the Textile Industry

Sercan EDİNSEL *(https://orcid.org/0000-0003-2831-7504), Turkish Military Forces, Türkiye; sedinsel@gmail.com*

Esra Gökçen KAYGISIZ *(https://orcid.org/0000-0002-4950-9508), Giresun University, Türkiye; esra.kaygisiz@giresun.edu.tr*

Karahan KARA *(https://orcid.org/0000-0002-1359-0244), Artvin Çoruh University, Türkiye; karahan.kara@artvin.edu.tr*

Yeşil Tedarikçi-Müşteri Bilgisi ve Örgütsel Yeşil Performans İlişkisinde Yeşil Bilgi Sistemlerinin Aracılık Rolü: Tekstil Endüstrisinde Ampirik Bir Analiz

Abstract

This study discusses the effect of knowledge levels of green suppliers and customers on the green performance of organisations and the role of green information systems in this relationship. Four hypotheses were developed in the study. The research was carried out on textile companies operating in Bursa, Türkiye. Between August and September 2022, 495 surveys were collected. Green supplier and green customer knowledge levels have a positive and significant effect on organisational green performance. Green information systems fully mediate between green supplier knowledge and green organisational performance. However, green information systems partially mediate between green customer knowledge and organisational performance.

Keywords : Green Supplier Knowledge, Green Customer Knowledge, Organisational Green Performance, Green Information Systems, Mediating Effect.

JEL Classification Codes : C12, L25, L67.

Öz

Bu çalışmada yeşil tedarikçi ve yeşil müşterilere ait bilgi düzeylerinin örgütlerin yeşil performansları üzerindeki etkisi ve bu ilişkide yeşil bilgi sitemlerinin rolü ele alınmıştır. Araştırmada dört hipotez geliştirilmiştir. Araştırma Bursa'da faaliyet gösteren tekstil firmaları üzerinde gerçekleştirilmiştir. Ağustos-Eylül 2022 tarihleri arasında 495 adet anket başarıyla toplanmıştır. Yeşil tedarikçi ve yeşil müşteri bilgi düzeyleri örgütsel yeşil performans üzerinde pozitif ve anlamlı etkiye sahiptir. Yeşil bilgi sistemleri yeşil tedarikçi bilgisi ile yeşil örgütsel performans arasında tam aracılık etkisine sahiptir. Fakat yeşil bilgi sistemleri yeşil müşteri bilgisi ile yeşil örgütsel performans arasında kısmı aracılık etkisine sahiptir.

Anahtar Sözcükler : Yeşil Tedarikçi Bilgisi, Yeşil Müşteri Bilgisi, Örgütsel Yeşil Performans, Yeşil Bilgi Sistemleri, Aracılık Etkisi.

1. Introduction

In this epoch, which is called the knowledge era, the gravity and vitalism of information are better understood day by day. The definition of supplier and customer prospect in supply chain structures is provided through information technologies. Inter-organisational information systems need to be established and developed for information exchange among organisations in the supply chain (Asamoah et al., 2021). In addition, the necessity of using information systems for supply chain integration is emphasised in the literature (Gu et al., 2021). Traditionally, the inclusion of reverse logistics processes in the supply flow from the supplier to the customer and the need to establish an environmentally oriented supply chain structure has revealed the concept of a green supply chain (Dahliani et al., 2023). In green supply chain management, it is expected to apply supply processes and environmental plans/actions. At this point, it is necessary to determine the environmental knowledge levels of suppliers and customers. Green supplier knowledge (GSK) covers the information about the supplier's environmental product and service strategies to determine the environmental sustainability targets of the supplier firms. On the other hand, green customer knowledge (GCK) includes information about the customers' environmental expectations to create the products and services of the companies from an environmentalist perspective (Agyabeng-Mensah et al., 2022).

Developing environmental strategies based on green-oriented human resources management depends on environmental organisational structures (Luu, 2020). In this process, green organisational culture plays an important role (Wang et al., 2020). Creating a green organisational culture also depends on other actors in the supply chain. At this point, the green expectations of suppliers and customers come to the fore. Green information systems (GIS) are needed to determine these expectations. GIS contributes to companies' environmental adaptation to minimise companies' harmful effects on the environment (Gholami et al., 2013). GIS also adds value to the success of green supply chain applications (Green et al., 2012). In supply chain integration, GIS is expected to contribute to the formation of organisational green performance (OGP) by contributing to the perception of supplier and customer expectations and the realisation of organisational activities in this way. It is important to develop OGP in this direction by correctly determining green supplier and customer knowledge, especially to make green production plans in the textile industry. In addition, strengthening the link between customers and suppliers using GIS also points to improving OGP. In this context, two basic research questions of our research were formed as follows.

- *Research question 1*: Do GSK and GCK impact OGP in the textile industry?
- *Research question 2*: Is there a mediating effect of GIS between GSK/GCK and OGP?

The concepts of GSK, GCK, GIS, and OGP are discussed in this study to address the research questions in the third section; hypotheses are created by reviewing the research on

the variables' connections. The approach is provided in the fourth section. The findings are presented in the fifth section. The findings and discussions are reported in the sixth section. The seventh section provides ideas and restrictions by offering recommendations according to the results.

2. Conceptual Framework

2.1. Green Supplier Knowledge

Numerous research findings assert that fruitful projects increasingly rely on obtaining exceptional information and expertise from stakeholders (Henke & Zhang, 2010). Being a part of the supply chain, suppliers are one of the most important contributors to the performance of products and firms due to their technical expertise (Molamohamadi et al., 2013). Supplier's knowledge gives information about public affairs, better products, and practices (Rosell et al., 2017), an ability to deliver on time, deal-making and can help set more realistic technology goals and provide information about process design, etc. (Yeniyurt et al., 2005; Tseng, 2009).

Because of growing environmental concerns, environmental contamination has greatly influenced companies' business operations (Zhao et al., 2018). This concern leads many firms to take steps to become more environmentally conscious or "green". So, firms must know suppliers' green strategies, supply chain capabilities, materials, processes, etc., to fulfil stakeholder demands (Lisi et al., 2020). "Green supplier knowledge (GSK)" refers to a company's understanding of its suppliers' supply chain strategies, practices, and features of their goods and services that are meant to accomplish environmental sustainability objectives (Agyabeng-Mensah et al., 2022). Finding information about suppliers may help companies develop, share, harvest, and leverage knowledge. As a result, learning about suppliers' green practices may assist firms in developing standards for their green supply chain management practices (Agyabeng-Mensah et al., 2021). With the assistance of suppliers knowledgeable about sustainability, businesses will be less likely to make mistakes, use resources, and produce waste inefficiently, which will help their prestige as more eco-friendly (Tseng, 2009).

2.2. Green Customer Knowledge

A "customer" is someone who purchases from another company. Customers are critical to firms as they generate income; without them, the company would cease to exist. Every business fights to attract customers through aggressive product advertising, cost-cutting methods to attract more customers, or distinctive goods and experiences people appreciate. Today's Customers are more creative and engaged than ever, and they have easy access to global communication with other firms. Customers, therefore, possess precious resources and insight that can be used as crucial sources for competition (Hoyer et al., 2010). The company's association with its customers allows it to learn about their beliefs, experiences, and attitudes, which constitute customer knowledge (Gebert et al., 2002). By

highlighting the customers' demands, customer knowledge influences the design of goods and services (De Luca & Atuahene-Gima, 2007). Thanks to this information, a company can focus on developing the service and product consumers value most. This enables the company to direct its strategy to meet customers' demands and achieve maximum customer value (Doll et al., 2010). Possessing valuable customer insight results in a competitive advantage. Businesses that learn what customers expect from them gain a competitive edge by concentrating on their strategy to maximise customer value and satisfy customer expectations (Barney, 1991; Grant, 1996).

Customers' growing ecological and ethical consciousness and calls to save energy, reduce waste and air pollution, and enhance consumer safety are putting pressure on businesses to take their ecological and ethical principles seriously (Simpson & Power, 2005). Businesses have been obliged to use green practices to lessen the environmental impact of their operations to fulfil the firm's clients' increasing sustainability aspirations (Agyabeng-Mensah et al., 2021). Knowledge of future and current environmental needs and preferences for a company's products and services is referred to as "green customer knowledge (GCK)" (Agyabeng-Mensah et al., 2022). The company will likely devote more time and resources to designing new green products or product components that consume less material, emit fewer toxic chemicals, and benefit the environment by reusing and recycling materials and parts to satisfy customers' demands for lowering environmental risks. This demonstrates that firms may discover innovative methods to create new processes and products that will protect the environment while enhancing the value of the customers' enterprises by understanding their consumers' present and future environmental demands (Taherparvar et al., 2014). Firms may utilise their expertise to create goods and services that align with customers' environmental views since resources and information are readily available (Lintukangas et al., 2015). Companies are more likely to become environmentally legitimate and develop a positive corporate reputation when their products and processes align with their customers' green philosophies. (Wei et al., 2020).

2.3. Green Information Systems

In recent years, information technologies used in all areas of life are constantly developing, changing, and diversifying. However, ensuring the continuity of information technologies depends on the sustainability of natural resources. Green informatics emerged and has been developed to solve many environmental problems from information technologies, significantly increasing carbon emissions. Hardware-oriented organisations need to focus on energy efficiency in using information technologies (Doğan et al., 2019). At this point, "green information systems (GIS)" come to the fore (Brendel et al., 2022). GIS information technologies strive to help environmental problems by targeting resource savings (Anthony, 2016). It also contributes to the development of sustainable business processes by highlighting efficiency in the design of business processes (Watson et al., 2010).

GIS, which contributes to increasing efficiency with the right resource planning in supply chain processes, creates value in improving company and supply chain performance. GIS also minimises material and energy consumption by considering reverse logistics processes in product and process designs (Meacham et al., 2013). GIS is generally accepted as an auxiliary element that contributes to the success of operational activities and organisational performance by increasing the integration among supply chain members (Seidel et al., 2017). With benefits, GIS helps managers monitor, view, store, and synthesise energy and resource consumption factors, waste generation, and pollution (Malhotra et al., 2013; Seidel et al., 2013; Qu & Liu, 2022). In this respect, GIS offers innovative solutions for monitoring, managing, and reducing negative environmental impacts (Carberry et al., 2019).

2.4. Organizational Green Performance

Businesses have contributed to environmental pollution, climate change, and the loss of human life through the production of non-biodegradable products, the release of greenhouse gases, disposal of wastes, storage of hazardous and highly flammable substances, and high resource use (Khan, 2019). Companies are becoming more concerned about environmental management due to the lack of energy, environmental degradation, and customers' increasing awareness of environmentally friendly products (Zhao et al., 2018).

Since the last quarter of the 20th century, there has been a rise in environmental awareness among individuals, businesses, governments, and society at large. This has coincided with increased concerns about corporate social responsibility and the company's reputation (Clark, 2000). Internal and external stakeholders refer to a firm as being "green" when they think it is genuinely dedicated to the ideal aim of "zero" - zero emissions, zero waste, and zero environmental impact (Ottman, 1998). According to research, more than 375 of the websites of the top 500 listed Standard & Poor's companies mention environmental performance and commitment (Alves, 2009). Therefore, the significance of environmental revelation stems from the desire of businesses to demonstrate to the public that they take environmental issues seriously (Cho et al., 2012). Firms are adopting green and social practices to lessen the environmental impact of their operations, maintain societal protection, boost productivity, gain competitive advantages, satisfy stakeholder demands, and enter new markets (Agyabeng-Mensah et al., 2021). In other words, Firms that actively pursue green innovation cannot only lessen their adverse environmental effects but also increase overall productivity, boost brand recognition, and enhance competitiveness (Chiou et al., 2011). These socially and ecologically responsible practices safeguard the health and well-being of employees as well as the demands of other stakeholders by minimising greenhouse gas emissions, waste creation, resource and energy consumption, and other related factors (Longoni et al., 2018).

3. Literature Review, Hypotheses Development and Research Models

Green supplier and customer information trigger organisations to turn to environmental approaches and transform organisational structures into these forms. Textile companies position their internal processes in the context of environmentalism. Collaboration with green suppliers is required to obtain environmentally friendly product outputs. In this process, the environmental knowledge of green suppliers plays an important role. On the other hand, to meet the environmentalist expectations of the customers, it is necessary to define the green customers. In this identification process, the environmental knowledge of the customers plays an important role. This research will investigate the effect of GSK and GCK on the OGP of textile companies. It is also aimed to explain the role of GIS in this relationship.

Cheng (2020) stated that green suppliers participating in supply chains affect supply chain management in two ways. These are increasing green information processing ability and revealing green technical skills. Green suppliers as a source of information also affect green performance development and product production. In a study conducted on 176 Chinese manufacturing companies, green supplier and green customer integration were found to have a strong link with green innovation success by Du et al. (2018). In addition, green customer integration with a high internal integration is important in increasing green innovation performance. According to the data collected from 475 participants of multinational manufacturing companies in Pakistan, Shahzad et al. (2020) determined that the information management process significantly affects corporate sustainable performance. With data from 163 container shipping companies in Taiwan, Yang et al. (2013) concluded that establishing green collaborations in external relations (Supplier-Customer relationship) increases green performance and applications. It has also been revealed that green external relations mediate, especially between green internal relations and firm competitiveness. Green supplier development also significantly affects supplier performance (Blome et al. 2014). Huang et al. (2016) highlight the importance of customers' environmental pressures in increasing organisations' environmental performance. It also discussed how green consumer pressure affects green organisations and innovation performance. Arfi et al. (2018) investigated the impact of outside sources of information on green innovation and organisational performance. According to the review's results, while external information sources play an active role in green innovation and organisational performance, hazards in transferring knowledge limit the beneficial effect. Two hypotheses have been developed to determine the effect of GSK and GCK on OGP. These hypotheses are as follows:

H1: GSK has a significant effect on OGP in textile companies.

H2: GCK has a significant effect on OGP in textile companies.

In the literature, the differences and similarities between green information systems and green information technologies (GIT) are emphasised. In addition to approaches that see

GIS and GIT as synonymous (Shevchuk & Oinas-Kukkonen, 2016), some studies accept GIT as a part of GIS (Melville, 2010).

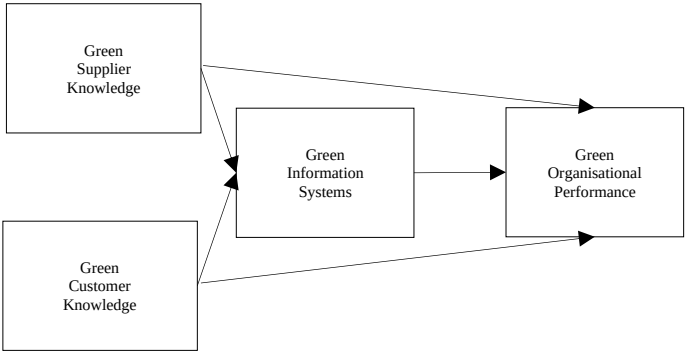
With a sample of senior managers from 405 companies, Gholami et al. (2013) tested that GIS can positively affect environmental performance with long-term planning. It has also been suggested that GIS can be used effectively in solving environmental problems. In light of 133 data collected from Malaysian organisations implementing environmentally friendly practices, Anthony J. (2019) found that organisations using GIS have high environmental performance. The necessity of GIS for pollution prevention, product management, and clean development initiatives was emphasised. In the sample of manufacturing companies operating in China, Ji et al. (2020) concluded that knowledge combination would strengthen green supplier integration in environmental performance. Based on data from 358 manufacturing companies in Taiwan, Green IT structural capital and relational capital, according to Chuang and Huang (2018), have a partly mediation influence on the link between green corporate social responsibility and green performance. According to Meacham et al. (2013), based on 159 manufacturing business managers, GIS can facilitate information exchange across supply chain participants. GIS plays a mediating function in the link between information systems and environmental performance. According to the literature, GIS appears to have been used in mediator effect models. Currently, the GIS variable will be used as a mediator variable in this empirical study. The following is the research's third hypothesis:

H3: GIS mediates between GSK and OGP in textile companies.

H4: GIS mediates between GCK and OGP in textile companies.

The research model of the hypotheses is presented in Figure 1.

Figure: 1
Research Model



4. Methodology

4.1. Scales of the Research

In this empirical research, the effect of GCK and GSK on OGP of companies operating in the textile industry and the mediating role of GIS in this relationship were investigated. The research was based on a questionnaire. To measure the variables, scales whose validity and reliability were tested in the literature were used. In addition, demographic variables were included in the survey application. A 5-point Likert scale was used ("1" strongly disagree, "5" strongly agree).

In this research, four variables are used in the research methodology. These are GSK, GCK, GIS and OGP. The following items represent the scales:

- The GSK scale was taken from Agyabeng-Mensah et al. (2022). The GSK scale has four items. Cronbach's alpha, average variance extracted (AVE) and composite reliability (CR) values of the GSK scale are 0.751, 0.834 and 0.893, respectively.
- The GCK scale was taken from Agyabeng-Mensah et al. (2022). The GCK scale has four items. Cronbach's alpha, AVE, and CR values of the GCK scale are 0.815, 0.580 and 0.788, respectively.
- The GIS scale was obtained from Qu and Liu (2022). The GIS scale has six items. Factor loads of all scale expressions are greater than 0.70. AVE value was determined as 0.800.
- The OGP scale is taken from Luu (2020). The OGP scale has four items. Cronbach's alpha, AVE, and CR values of the OGP scale are 0.830, 0.710 and 0.860, respectively.

4.2. Sampling

In this research, in which the relationship of textile companies GSK, GCK, GIS, and OGP is discussed, the sample was determined from the employees of textile companies operating in the Bursa Industrial Zone. There are 78 textile companies registered in the Bursa Industrial Zone (BOSB, 2022). The research was carried out in the form of a questionnaire. The prepared questionnaire was sent to the employees electronically. 495 successful surveys were obtained. Survey data was collected in August and September of 2022. It was obtained randomly from the textile companies by convenience sampling method. According to the 95% confidence, 495 respondents are sufficient (Bartlett et al., 2001). The fundamental criteria considered in sample selection are as follows:

- The universe comprises employees working in textile companies in the Bursa Industrial Zone. The sample is drawn from within this universe.
- Employees working in textile companies, regardless of gender, are randomly selected.

- Individuals aged 18 and older are included in the sample (excluding interns).
- The sample does not include employees lacking basic literacy skills.
- Individuals who cannot complete the survey are excluded from the sample.
- Individuals who fill out the survey in an irrelevant or incorrect manner (e.g., marking all answers as "1") are not included in the sample.

Table: 1
Sampling

Gender	Number	%	Marital Status	Number	%
Man	311	62.8	Married	393	79.4
Woman	184	37.2	Single	102	20.6
Total	495	100	Total	495	100
Tenure	**Number**	**%**	**Age**	**Number**	**%**
0-5	77	15.6	18-25	61	12.3
6-10	134	27.0	26-35	128	25.9
11-15	139	28.1	36-45	137	27.6
16-20	66	13.3	46-55	86	17.4
21+	79	16.0	56+	83	16.8
Total	495	100	Total	495	100

The demographic of the sample area is presented in Table 1. 62.8% of the participants in the research are men, and 37.2% are women. 79.4% are married and 20.6% are single. The highest density is in the 36-45 age group. The second is the 26-35 age group. These two groups are very close to each other. According to Tenure, the highest density is between 11 and 15 years. The second is between 6 and 10 years. These two groups are very close to each other.

5. Findings

5.1. Normality Tests

GSK, GCK, GIS, and OGP scales were used in this study. In this section, sampling proficiency tests, normal distribution tests, and validity and reliability tests of the scales were performed. These tests were carried out with the SPSS program. Normality test was performed with The Kolmogorov and Smirnov (KS) normality test. In addition, the kurtosis and skewness values of the variables were observed with the Q-Q Plot charts (Appendix).

Table 2. Normality Test Findings, Skewness, And Kurtosis Scores

Scales	N	Mean	SD	Kolmogorov-Smirnov Z	Asymp. Sig.	Skewness	Kurtosis
Green Supplier Knowledge	495	3.18	0.78	2.189844	0.000	0.116	0.212
Green Customer Knowledge	495	4.05	0.81	5.454060	0.000	-1.222	2.112
Green Information System	495	2.87	0.88	1.665111	0.000	0.318	-0.206
Organisational Green Performance	495	3.49	0.95	3.448526	0.000	-0.591	-0.111

KS normality test findings, Kurtosis, and Skewness Scores are shown in Table 2. It is expected that the kurtosis scores of the variables will be lower than "3" and the skewness scores will be lower than "10" (Kline, 2011). The kurtosis and skewness values in Table 2 indicate a normal distribution. Thus, our data set has a normal distribution.

5.2. Validity And Reliability of The Scales

Kaiser Meyer Olkin (KMO) and Bartlett's Test of Sphericity (BTS) determined the sample area proficiency test. KMO and BTS test findings are presented in Table 3. KMO values of GCK, GIS, and OGP variables are greater than 0.70, and BTS values are less than 0.01. The sample adequacy of these variables is at the meritorious level. The KMO value of the GSK variable is greater than 0.60, and the BTS is less than 0.01. The adequacy of this variant with the example is at a mediocre level. According to these findings, it is accepted that the sample area was sufficient (Tabachnick et al., 2007).

Table: 3
KMO and BTS Findings

		GSK	GCK	GIS	OGP
KMO		0.668	0.849	0.833	0.810
BTS	**Approx. Chi-Sq.**	579.359	2297.319	1567.289	1609.453
	df	6	6	15	6
	Sig.	0.000	0.000	0.000	0.000

Information about the scales used in the research is explained in the methodology section. Since the sample area is Türkiye, scale expressions were translated into Turkish. The steps suggested by Brislin (1973) were followed in translating the scales into different languages and cultures. Exploratory factor analysis (EFA) was performed due to the application in a different language and sample area.

Table 4. EFA Findings

Items	Factor Loads	Eigenvalues / Total Variance Percentage	Cronbach's Alpha(α)
GSK3- "We have well-developed knowledge about suppliers' green strategies."	0.874	2.292 / % 57.307	0.741
GSK2- "We had well-developed knowledge about the suppliers' green supply chain capabilities."	0.825		
GSK4- "We have well-developed knowledge about suppliers' green materials."	0.655		
GSK1- "We have well-developed knowledge about suppliers' green operational processes."	0.647		
GCK2- "We have well-developed knowledge about which the customers most valued green product/service features."	0.958	3.545 / % 88.627	0.956
GCK3- "We have well-developed knowledge about the customers' green requirements."	0.958		
GCK4- "We have well-developed knowledge about what customers want."	0.939		
GCK1- "We have well-developed knowledge about the customers' expected green product quality levels."	0.910		
GIS5- "We regularly track, monitor, and share environmental information within the company."	0.824	3.765 / % 62.744	0.881
GIS6- "The firm has a well-developed database to track and monitor environmental issues."	0.803		
GIS4- "We formally track and report the environmental performance within our company."	0.799		
GIS1- "Our company has a formal system regarding environment improvement in operation."	0.777		
GIS3- "The practices and steps in the system regarding green practices are widely available."	0.776		
GIS2- "We have formal departments responsible for environmental affairs."	0.772		
OGP2- "Our company reduced the environmental impact of its services."	0.939	3.122 / % 78.041	0.901
OGP3- "Our company reduced environmental impact by establishing partnerships."	0.934		
OGP1- "Our company reduced waste and emissions from operations."	0.921		
OGP4- "Our company reduced the risk of environmental accidents, spills, and releases."	0.721		

EFA analysis was done with the SPSS program. EFA findings are presented in Table 4. All factor loads of scale items are higher than 0.40. When the Eigenvalues and Total Variance Percentage values are examined, all values exceed 50%. Total Variance Percentage

is also at the expected level (Büyüköztürk, 2008). The Cronbach's Alpha (α) of the GSK, GCK, GIS, and OGP scales are 0.741, 0.956, 0.881, and 0.901, respectively (Table 4). While the GCK, GSK, and OGP scales have high reliability, the reliability level of the GIS scale is acceptable.

Confirmatory factor analysis (CFA) findings are seen in Table 5. CFA analyses are obtained with the AMOS program.

Table: 5
CFA Findings

Parameter Estimates	Estimate	S.E.	Fit Values	AVE / CR
Measuring Model				
GSK3<--- GSK	0.951*	0.045	"X^2 [2.4, N=495] = 1, CMIN/df (2.360)**, CFI (0.998)***, RFI (0.976)***, IFI (0.998)***, TLI (0.986)*** NFI (0.996)***, RMSEA (0.052)*****"	0.573 / 0.840
GSK2<--- GSK	0.770*	0.046		
GSK1<--- GSK	0.430*	0.045		
GSK4<--- GSK	0.417*	0.051		
GCK3<--- GCK	0.971*	0.038	"X^2 [3.5, N=495] = 1, CMIN/df (3.470)**, CFI (0.999)***, RFI (0.991)***, IFI (0.999)***, TLI (0.994)***, NFI (0.998)***, RMSEA (0.071)*****"	0.886 / 0.968
GCK2<--- GCK	0.941*	0.038		
GCK4<--- GCK	0.909*	0.037		
GCK1<--- GCK	0.884*	0.042		
GIS5 <--- GIS	0.860*	0.051	"X^2 [16.2, N=495] = 6, CMIN/df (2.704)**, CFI (0.993)***, RFI (0.974)***, IFI (0.993)***, TLI (0.984)*** NFI (0.990)***, RMSEA (0.059)*****"	0.627 / 0.909
GIS6 <--- GIS	0.788*	0.052		
GIS4 <--- GIS	0.699*	0.047		
GIS2 <--- GIS	0.680*	0.053		
GIS3 <--- GIS	0.679*	0.049		
GIS1 <--- GIS	0.657*	0.050		
OGP2 <--- OGP	0.963*	0.047	"X^2 [1.7, N=495] = 1, CMIN/df (1.670)**, CFI (1.000)***, RFI (0.994)***, IFI (1.000)***, TLI (0.998)*** NFI (0.999)***, RMSEA (0.037)*****"	0.780 / 0.933
OGP3 <--- OGP	0.909*	0.027		
OGP1 <--- OGP	0.892*	0.052		
OGP4 <--- OGP	0.617*	0.049		

Notes: " p<0.01, ** CMIN/df< 5 (Acceptable fit), **** CFI, NFI, RFI, IFI, TLI > 0.90 (Good fit), **** RMSEA < 0.05 (Good fit). **** 0.05 <RMSEA < 0.08 (Acceptable fit)".*

Estimate and standard error values are at the acceptable level. Moreover, model fit values are acceptable (Tabachnick et al., 2007). According to the findings of the validity and reliability tests, the scales are reliable and valid. In addition, it is understood that the scales provide convergent and divergent validity according to AVE and CR values. AVE scale values are greater than 0.50, and CR values are greater than AVE values (Fornell & Larcker, 1981).

The correlation between the variables was observed to create a model structure for the relations among the variables. Table 6 shows the correlation relationships between the variables.

Table: 6
Correlations Findings

Variables	Mean	S.D	GSK	GCK	GIS	OGP
GSK	3.18	0.78	1			
GCK	4.05	0.81	0.291*	1		
GIS	2.87	0.88	0.387*	0.434*	1	
OGP	3.49	0.95	0.397*	0.617*	0.711*	1

*Notes: * p < 0.01 (2-tailed).*

All correlation relationships are significant. Correlation relationships between the dependent variable OGP and the independent variables are examined. The lowest correlation is between OGP and GSK ($r(495)=0.397$, $p<0.01$). The highest correlation is between OGP and GIS ($r(495)=0.711$, $p<0.01$). The level of correlation between OGP and GCK is also high ($r(495)=0.716171$, $p<0.01$). Since the correlation values were not above 85%, discriminant validity was also provided.

5.3. Test of The Research Hypothesis

For the research model, the H1 tests the effect of GSK on OGP; the H2 tests the effect of GCK on OGP. According to the first structural equation model, GSK and GCK are accepted as independent variables and OGP as dependent variables. Structural equation model (SEM) findings are seen in Figure 2. The estimation and standard error values of GSK and GCK are shown in Table 7.

Figure: 2
The Path Analysis Model of GSK, GCK, and OGP Findings

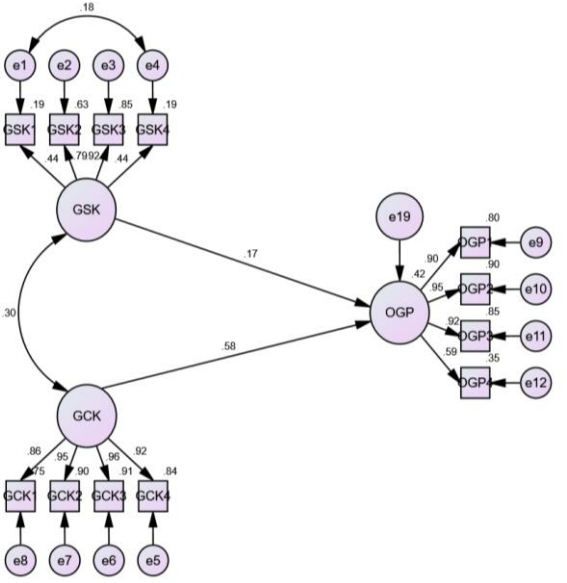


Table: 7
The Path Analysis Model of GSK, GCK, and OGP Findings

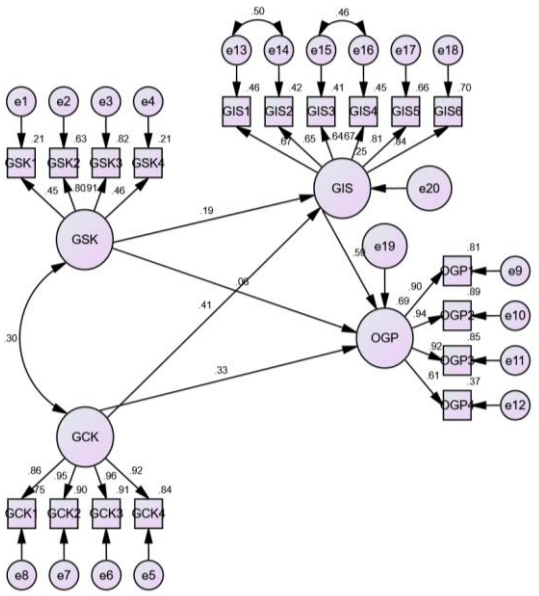
Parameter	Estimate	S.E.	Fit Values
Structural Model			
OGP <--- GSK	0.17*	0.104*	X^2 [397.5, N=495] = 147, CMIN/df (4.090) **, CFI (0.968)***, RFI (0.945)***, IFI (0.968)***, TLI (0.958) *** NFI (0.959)***, RMSEA (0.079)****
OGP <--- GCK	0.58*	0.058*	

*Note(s): * p<0.01, ** 3<CMIN/df<5 (accaptable fit), *** CFI, NFI, RFI, IFI, TLI > 0.90 (acceptable fit), **** 0.05 <RMSA< 0.08 (Acceptable fit).*

The effect of GSK and GCK on OGP is significant. Moreover, model fit values are at an acceptable level. According to this finding, *The H0 hypothesis is rejected, and the first and second hypotheses are supported*. When the effect sizes are examined, GCK ($\beta = 0.58$, $p < 0.01$) affects OGP more than GSK ($\beta = 0.17$, $p < 0.01$).

Mediating model studies are applied by Baron and Kenny (1986). These conditions are: (i) The independent variables must significantly affect the dependent variable. (ii) Independent variables must significantly affect the mediating variable. (iii) In the analysis in which the independent variable (X) and the mediating variable (M) are included together and their effects on the dependent variable (Y) are determined, the effect of the mediating variable (M) on the dependent variable (Y) should be statistically significant. (iv) After the mediating variable is included in the model, the effect of the independent variables on the dependent variables should either become insignificant or decrease in the effect level. In this empirical research, the effect of independent variables on the dependent variable was tested with the first and second hypotheses. The first and second hypotheses were accepted. The independent variables (GCK and GSK) significantly affect the dependent variable (OGP). The first condition is met. Then, the mediating variable is included in the model. The standardised SEM model is presented in Figure 3.

Figure: 3
The Path Analysis Model of GSK, GCK, GIS, and OGP Findings



Path analysis findings are reported in Table 8.

Table: 8
The Path Analysis Model of GSK, GCK, and OGP Findings

Parameter	Estimate	S.E.	Fit Values
Structural Model			
GIS <--- GSK	0.19*	0.088	X^2 [448.9, N=495] = 127,
GIS <--- GCK	0.41*	0.053	CMIN/df (3.535)***,
OGP <--- GSK	0.06[a]	0.079	CFI (0.953)****, RFI (0.923)****,
OGP <--- GCK	0.33*	0.050	IFI (0.953)****, TLI (0.944) **** NFI (0.936)****,
OGP <--- GIS	0.59*	0.068	RMSEA (0.072)*****

*Note(s): * p<0.01, *** 3<CMIN/df<5 (Acceptable fit), **** CFI, NFI, RFI, IFI, TLI > 0.90 (Acceptable fit), **** 0.05<RMSA<0.08 (Acceptable fit), [a] p=0.064>0.01,*

Model fit values are found to be at an acceptable level. It is determined that the independent variables (GSK and GCK) have a significant effect on the mediating variable (GIS) in the relations between the variables ($\beta_{GSK} = 0.19, p < 0.01$ *and* $\beta_{GCK} = 0.41, p < 0.01$). The second condition is met. The GIS (as a mediating variable) has a significant effect on the OGP (as a dependent variable) ($\beta_{GIS} = 0.59, p < 0.01$). The third condition is met. The effect of GSK on the OGP became insignificant ($\beta_{GSK} = 0.06, p=0.064>0.01$). Although the effect of GCK on the OGP was significant, its effect level decreased ($\beta_{CSK} = 0.33, p<0.01$). At this point, it has been determined that GIS has a full mediator effect in the relationship between GSK and OGP and a partial mediation effect in the relationship between GCK and OGP. The H_0 *hypothesis is rejected, and the third and fourth hypotheses are supported.*

6. Results and Discussion

This study focuses on the ecological attitudes of clients and vendors based on integrating information among supply chain actors. With this concept, the initial goal of the study is to determine whether GSK and GCK have a meaningful influence on OGP. The other goal is to shed light on the role of GIS in both the GSK-OGP interaction and the GCK-OGP relationship. Within the framework of the literature review, four hypotheses were created. The first hypothesis examined the effect of GSK on OGP. The effect of GCK on OGP was investigated in the second hypothesis. The third and fourth hypotheses evaluated the involvement of GIS in the link between GSK-OGP and GCK-OGP. According to the H1, GSK has a considerable and favourable influence on OGP. This conclusion confirms Cheng's (2020) argument that building the supply chain around green suppliers promotes green performance. Furthermore, when analysing the influence of green supplier pressure on business performance, it is noted that information about a company's green suppliers has a beneficial effect on performance (Du et al., 2018). organisations try to reduce the supplier's lack of knowledge about environmental practices by paying close attention to pollution and waste levels (Zhang et al., 2019). They do this through audits, selections, supplier certification, an exit mechanism, and performance management (Shah & Soomro, 2021). These processes lead the organisation to redirect its attention towards enhancing the supplier's environmental knowledge, negatively impacting organisational performance. Consequently, it can be asserted that greater supplier environmental awareness and knowledge correspond to textile companies' heightened organisational green performance.

Based on the findings of the H2, it was determined that GCK has a positive and significant effect on OGP. Customers' green expectations are among the most critical factors in manufacturing companies' green-oriented development of products and process designs. They consider the environmental demands of customers in the production of green products. This can happen when producer-customer integration meets the green framework (Yang et al., 2013). The second finding of the study supports the fulfilment of this expectation. It is understood that knowing the environmental perspectives of the textile companies' customers determines green organisational performance. Based on the customer-oriented approach, it can be said that having green customers causes green organisational structures, and the level of the customer's environmental awareness directly influences the maintenance, inspection, certification, and advancement of environmental initiatives, consequently impacting the green performance of the supplier organisation.

According to the findings, the H3 and H4 GIS have a partial mediator effect between GSK and OGP and a full mediator effect between GCK and OGP. Contrary to expectations, the GIS variable has a partial mediation effect instead of a full mediation effect in the GSK and OGP relationship. Therefore, it constitutes the striking point of the research. This result is coherent with Renaldo and Augustine (2022), who say that GIS has a positive but insignificant effect on environmental performance and that implementing a good GIS will improve environmental performance even though it will not have a big impact.

The fact that textile companies in the supply chain provide information flow between customers and suppliers with GIS contributes to green organisational performance. In the literature, there are studies supporting the idea that information systems play an active role in the development of relations with both suppliers and customers (Meacham et al., 2013; Anthony, 2019). The development of GIS in a manner that considers environmentalist expectations also supports the environmentalist approaches of customers and suppliers. Gholami et al. (2013) point out that GIS significantly impacts performance. These findings contribute to the concreteness of this effect. Chuang and Huang (2018) indicate the partial mediating effect of green IT on the green performance of companies' capital. Considering suppliers' role in forming companies' capital, the finding of the partial mediation effect of GIS between GSK and OGP shows parallelism.

Finally, to establish and develop green performance at the organisational level in textile companies, the suppliers' environmentalist approaches and the customers' environmentalist expectations must be met. At the same time, ensuring the flow of information in the supply chain by establishing environmental information technology infrastructures indirectly improves organisations' environmental performance. Thus, textile companies are recommended to turn to green information technologies.

7. Suggestions and Limitations

Nowadays, it is seen in theoretical and practical applications that environmental approaches are increasingly being adopted. At the same time, considering the effect of information technologies on the flow of information in the supply chain, it needs to keep up with environmental change. As the use of environmental information systems increases, it is understood that textile companies should focus more on environmental organisations and increase their environmental applications.

Suggestions to textile companies are: (i) To establish green organisational structures and increase performance, suppliers and customers should be well acquainted with environmentalist expectations. (ii) It should be directed towards green information systems and technology in supply chain management processes. (iii) Textile companies should closely follow green innovation practices based on environmental information technology. (iv) In establishing green organisational structures, it is necessary to use environmentalist individuals and systems and to the expectations of customers and suppliers.

Suggestions for researchers are as follows: (i) The research model for determining the effect of green logistics knowledge on OGP should be examined. (ii) The research model for determining the effect of green competitor knowledge on OGP should be examined. (iii) The research model to determine the GIS' role in the relation of green logistics knowledge and competitor knowledge with OGP should be examined.

The limitations of this research are as follows: (i) A sample of textile companies carried out the research. Differences may be observed in the findings obtained in a different manufacturing company. For this reason, the study has a sample area constraint. (ii) The research was conducted at a time covering post-pandemic conditions. Differentiation can be observed in the data obtained under different conditions. (iii) It is accepted that the sample area represents the universe. (iv) The research was conducted on Bursa Industrial Zone textile companies. Different findings can be found in different organised industrial zones. (v) Research focuses on detecting the mediating effect. Relationships between variables can lead to various results in various regression models.

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Appendix