

Does Organizational Green Culture Impact Competitive Advantage and Green Performance with Mediation of Green Innovation?

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Abstract: The competitive landscape is undergoing a rapid transformation because of the increasing public concern regarding the natural environment, which is compelling firms to implement green innovation strategies. Although there has been not much study on green innovation, the concept has been acknowledged by numerous manufacturing firms. By the logic of natural resource-based view theory (NRBV), the objective of this paper is to empirically construct and test a theoretical model that examines the impact of organizational green culture (OGC) on green innovation (GI), competitive advantage (CA) and green performance (GP). It also investigates the influence of GI on CA and GP. This model elucidates how green innovation mediates these associations. The researchers gathered data from 319 manufacturing enterprises in Punjab, Pakistan. The data were analyzed using smartPLS 3.2.9 (variance-based software). This paper employs a questionnaire to collect primary data from managers. The study's results indicate that OGC substantially predicted GI, CA, and GP. In addition, GI has a substantial effect on GP and CA. The results also indicate that GI partially mediates the relationship between OGC-CA and OGC-GP. Some limitations are providing directions for future investigations.

Keywords: Organizational Green Culture, Competitive Advantage, Green Performance, Green Innovation.

Introduction

As decision-makers in the manufacturing industries confront rising public sensitivity, stronger environmental legislation, and increased demand from shareholders to protect the natural environment, environmental issues are assuming a more central role in these sectors (Leonidou et al., 2013; Yu et al., 2017). Issues such as soil erosion, carbon restrictions, climate change, and power shortages have emerged as major concerns for the manufacturing sector on the supply side (Delmas & Toffel, 2008). According to demand-side research, customers are showing a growing preference for eco-friendly services and products (Zhu et al., 2008; Kotler, 2011). In an effort to reduce environmental damage, the government is implementing a system to track and regulate the ecological repercussions of production activities. As a result, manufacturing enterprises' innovation has been affected by environmental concerns.

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There are several factors that affect GI, but one of the most important is organizational green culture (OGC). OGC is a resource that may enhance green performance (GP) and competitive advantage (CA), as shown by Hart (1995), which has a crucial impact on the environment (Banerjee, 2002). In this context, "culture" means the norms, assumptions, and practices that employees hold and that influence how the company operates. A group of managers can establish and communicate a set of principles that will serve as the basis for the company's culture and, ultimately, its success (Gao, 2017). So, we think about OGC, whose principals have accepted company-wide and which are usually spelled out in a mission statement that all managers and workers must adhere to (Stone et al., 2004). As a result, OGC has the potential to inspire workers to take environmental concerns seriously and promote GI as an organizational value.

In light of this fresh insight, "green innovation (GI)" has emerged as a response, with an emphasis on environmentally friendly tactics that help industrial businesses meet their environmental protection goals (Robinson & Stubberud, 2013). Andersen (2008) claims that there has been little progress in GI research thus far. There are scant empirical studies addressing innovation and environmental concerns in the existing literature. Prior studies confirmed that OGC and GI have the ability to enhance the CA and GP of a business (Gürlek & Tuna, 2018; Wang, 2019; Tu & Wu, 2021; Ha et al., 2024). GI and performance studies have also produced contradictory findings. On the other hand, GI techniques may not boost profitability, but they can be implemented if manufacturing firms are urged to utilize them (Rao & Holt, 2005). The extra development time and expenses associated with such integration, according to other research, could lead to poor output (Das et al., 2006; Ragatz et al., 2002). Following these contradictory findings, researchers have been more eager to learn how GI and performance relate to one another in the businesses being studied (Martins & Terblanche, 2003; McLean, 2005). In light of these inconsistencies, the objective is to ascertain whether GI genuinely results in environmentally friendly performance for businesses or not.

UN member nations adopted the 2030 Agenda, or Sustainable Development Goals, in 2015. Pakistan prioritizes carbon neutrality and environmental protection. Khan et al. (2024) say manufacturing companies have important SDGs. Several studies have indicated that developing nations are more susceptible to environmental calamities (Adenle et al., 2015; Sharma, 2022). Thus, organizations in these nations need help optimizing their assets.

This research is essential because it addresses a multitude of knowledge deficits. Initially, the purpose of this investigation is to investigate the direct influence of OGC on GI, CA, and GP. It also investigates the impact of GI on CA and GP. Secondly, examine the role of GI as a mediator in the relationship between OGC-CA and OGC-GP. The findings are expected to contribute to the growing body of literature on GI within non-Western settings, as this research was conducted in Pakistan. Third: To the author's knowledge, there has been a dearth of empirical research that has investigated the mediating function of GI between suggested connections in the manufacturing sector. As a result, the utilization of GI as a mediator in Pakistan's manufacturing industry is a unique advancement. Additionally, this scholarly article employs the natural resource-based view theory (NRBV) to examine the relationships. Furthermore, it facilitates the realization of the UN SDGs (e.g. 9, 12, and 13), which encompass "industry, innovations, and infrastructure," "responsible consumption and production," and "climate action." This study contributes to our understanding by investigating the mediating role of GI between manufacturing businesses' essential resources (such as OGC, GP, and CA) in the context of the Pakistani manufacturing sector. The main sources of data are managers working in the manufacturing industry in Punjab, Pakistan. The data was analyzed using PLS-SEM, a statistical software tool. There are theoretical and managerial implications to the study.

Theory and Hypotheses

Natural Resource-based View (NRBV)

Gaining an edge over competitors is a key function of organizational resources and capabilities, according to RBV theory (Barney, 1991). In addition, Hart (1995) cites the "natural resource-based view theory" (NRBV) as a development of RBV theory, which suggests that firms could obtain a CA in the long run by addressing environmental issues. An analysis of the RBV theory by Hart (1995) reveals multiple problems. One way it does this is by severing ties between a company and its surrounding environment. Our NRBV-based hypotheses are that the studied constructs may help businesses improve their environmental management, give them an advantage in the market, and strengthen the foundations of NRBV. The business's reputation and performance could be affected by these. Stakeholders are better engaged via these projects, which have multiple advantages, such as lowering risk, improving reputation, and gaining a competitive edge (Schmelzer, 2013). A study employed

stakeholder and NRB theory to analyze the effects of GI, CSR, and OGC on business performance (Jabeen et al., 2024a). Previous studies investigated the effects of Corporate Social Responsibility, GI, and Green Transformational Leadership on sustainable company performance via the lens of the Natural Resource-Based View hypothesis (Zain et al., 2023a). A recent study investigated the mediating function of EP in the relationship between GI, GHRM, and sustainable business performance (Zain et al., 2023b). Accordingly, this work employs OGC to enhance CA and GP via GI mediation considering NRBV theory.

Organizational Green Culture (OGC) and Competitive Advantage (CA)

Having an edge on the competition in the marketplace is what is known as a CA (Porter, 1985). Producing positive value at or above the level of competitors is essential for a corporation to attain CA. The "natural resource-based view (NRBV)" is the best theory to study the relationship between OGC and CA of the firm, initially put forth by Hart (1995). Companies need to be flexible enough to adapt to new environmental challenges by creating assets (Menguc & Ozanne, 2005). Since an OGC's traits should be distinct from its competitors' cultures and, as an intangible asset, should be hard to replicate, it follows that OGCs can provide a CA.

With OGC's help, employees can come to see environmental concerns as core values, which in turn boosts CA (Bansal, 2003). That is to say, when an OGC is solid, it assists workers in comprehending the company's environmental strategy. When this is the case, workers will be able to tell if the OGC is fundamental to the company. Environmental preservation values can be generated by the firm's operations and policies, leading to a CA (Qi et al., 2012). According to Aragón-Correa and Sharma (2003), if a company adopts an OGC strategy, it may be able to separate its CA from its notably eco-friendly principles in the minds of consumers. Furthermore, according to Leonidou et al. (2015), a company might gain a more unique public perception by fostering a greener culture within the company. Therefore, a firm can benefit from an OGC that supports acceptable employee behavior and commercial value if CA is based on these factors.

Organizational Green Culture (OGC) and Green Performance (GP)

The effectiveness and efficacy of the environmental actions of a business can be measured by GP, which is essential for the survival of businesses (Chinander, 2001; Ilinitich et al., 1998; Veleva & Ellenbecker, 2000). The impact on the environment of business activities is known as "GP" (Olsthoorn et al., 2001). According to earlier studies, OGC has the potential to modify long-held organizational beliefs, and individuals within the company play an important part as change agents (Rao & Holt, 2005). A green culture plan is more likely to be implemented by companies whose managers demonstrate a strong commitment to environmental protection. This finding is supported by Klassen and Vachon (2003) and Yung et al. (2011). A company's operations pertaining to various environmentally conscious goods can be improved and integrated through formal OGC rooted in eco-environmental principles (Banerjee et al., 2003). Thus, OGC assists companies in turning their eco-friendly strategies into sustainability (Schlegelmilch et al., 1996). Moreover, a study by Jabeen (2024a) confirmed that OGC has a significant impact on firm performance. Customer engagement is very important for the success of a business, as it promotes reputation (Fida et al., 2023), which ultimately provides CA.

Managers confront an issue when faced with environmental pressures on manufacturing firms: maximize profits by not focusing on GP (Russo & Fouts, 1997). Companies that don't have a green culture may find it difficult to invest in eco-friendly actions due to a lack of resources. As a result, business executives might choose to put more fundamental goals above following environmental rules. Nonetheless, environmental activity cannot be supported without such resources. For this reason, the second goal is to be more appealing to a manufacturing organization. In contrast, OGC can play a significant role in driving GP when environmental protection organizations put pressure on OGC-holding enterprises to create and report on GP. One possible first goal for an ideal level of environmental performance is the most suitable replacement.

Organizational Green Culture (OGC) and Green Innovation (GI)

GI is defined as "New products and processes which provide customer and business value but significantly decrease environmental impacts" (Fussler & James, 1996). Similarly, GI is the "introduction of any new or significantly improved product, process, organizational change or marketing solution that reduces the use of natural resources and decreases the release of harmful substances across the whole life cycle." Another study has determined that "eco-innovation means the creation of novel and competitively priced goods, processes, systems, services, and brings the quality of life to all people with a life-cycle-wide minimal use of natural

resources per unit output, and a minimal release of toxic substances." Thus, we say that improvements in management, processes, or products that significantly lessen environmental impacts are examples of GI (De Medeiros et al., [2018](#)).

Leadership, culture, and strategy of an organization are the three main factors that propel innovation (O'Regan & Ghobadian, [2005](#)). In addition, they discovered that companies with a well-defined culture had much higher levels of creativity compared to companies with less invention. Organizations can enhance GI when their environmental culture and policies are well-defined (Porter & Van der Linde, [1995a](#)). Greeno and Robinson ([1992](#)) found that OGC can encourage technological innovation in environmental protection. The operational guidelines and standards (OGC) of a company that promotes environmentally friendly practices are the basis of any GI strategy. OGC can promote GI (Özsomer et al., [1997](#)). Managers must focus on a green-oriented culture and put policies in place to save the environment, which boosts GI within the company. Therefore, businesses can set themselves apart from rivals in the GI space by ensuring that their corporate culture is in sync with environmental quality standards.

Mediating Role of Green Innovation (GI)

According to earlier research (Eiadat et al., [2008](#); Horbach, [2008](#); Karna et al., [2016](#)), there is substantial evidence that OGC improves GP. However, this data is not applicable in a general sense. Green practices (such as green marketing, CSR, and GI) have a significant influence on sustainability and enhance CA and GP (Jabeen et al., [2023](#); Zain et al., [2023a](#); Zain et al., [2023b](#)). GI has the ability to enhance environmental performance and sustainable business performance (Zain et al., [2023b](#)). The connection between OGC, CA, and GP highlights the contrasting viewpoints that firms hold toward environmental investments. It has been suggested that performance and CA are influenced by OGC, for example, by Zhu et al. ([2007](#)). However, there's no proof that environmental support has a major effect on CA, according to Triebswetter and Hitchens ([2005](#)). The use of GI as a mediator among OGC, CA, and GP may help to provide a clear picture of these links.

Green Innovation (GI) Mediates the Relationship between Organizational Green Culture (OGC) and Competitive Advantage (CA)

OGC clarifies a firm's CA, which may be seen in GI that appeals to the green image of organizations that attract customers (Higgins & McAllaster, [2002](#); Jamrog et al., [2006](#); Lau & Ngo, [2004](#)). Additionally, OGC promotes organizational values. Simply put, OGC aims to boost the firm's CA. When managers observe exceptional GI, it's recognized as a distinguishing advantage that helps them reduce pollution (Banerjee, [2001](#); Bonifant et al., [1995](#)). Researchers indicate that a company's CA can be enhanced by implementing a GI strategy (Guoyou et al., [2013](#); Kushwaha & Sharma, [2016](#)). Customer engagement is very important for the success of a business, as it promotes loyalty, retention (Danyal et al., [2024](#)), and reputation (Fida et al., [2023](#)), which ultimately provides CA. Employees must learn about environmental protection and disseminate their knowledge throughout the company, according to the theory of GI. So, repurposing existing information is at the heart of GI. According to Leonard-Barton ([1995](#)), a company's CA can be enhanced through innovation when workers contribute their ideas to manufacturing processes. Not only should OGC be dedicated to ecological problems, but its employees must be educated on GI if the company wants to be seen as a competitive resource. As a result, OGC fosters GI and distributes it throughout the organization, giving it a CA.

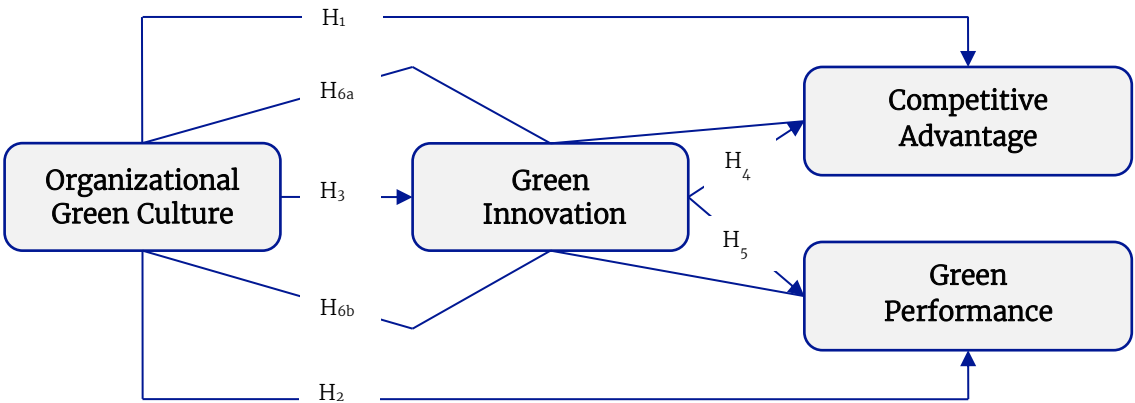
Green Innovation (GI) Mediates the Relationship between Organizational Green Culture (OGC) and Green Performance (GP)

According to Michaelis et al. ([2018](#)), businesses that back GI can enhance, which boosts their company image and can lead to the creation of new markets. A company's green image and reputation can be bolstered, manufacturing waste can be minimized, and pollution can be reduced, all thanks to GI, which is actively promoted by firms with well-designed OGC. Since consumers are increasingly concerned about the environment and governments are enacting stringent legislation to safeguard it, this could boost the company's GP (Berry & Rondinelli, [1998](#); Chen et al., [2006](#)). The control inside the organization is necessary for change, and creativity can only be generated by OGC's commitment to a common goal (Miles et al., 2000). Nowadays, customers not only rely on advertising, risks, and trust (Jabeen et al., [2024b](#)), but they are also conscious of the environment. GI helps to enhance sustainable business performance (Zain et al., [2023a](#)). Few businesses have succeeded in creating and sustaining a company-wide mission statement, making the shared vision a scarce (firm-specific) resource from a resource-based perspective. Companies with management that care deeply about protecting the

environment should focus on eco strategies. That is why OGC has the potential to boost a company's GP and initiate GI (Weller, 2006). By encouraging businesses to embrace GI, OGC indirectly impacts their GP. So, only GI is directly impacted by OGC, and GI is the intermediary between OGC and GP. So, we posited the following hypotheses:

- H1:** OGC has a substantial impact on CA.
- H2:** OGC has a substantial impact on GP.
- H3:** OGC has a substantial impact on GI.
- H4:** GI has a substantial impact on CA.
- H5:** GI has a substantial impact on GP.
- H6a:** GI is a mediator between OGC and CA.
- H6b:** GI is a mediator between OGC and GP.

Figure 1
Framework



Methodology

The plan or strategy that guides an investigation from beginning to end is called a research design. It reveals the methods of data collection and the analytical strategy employed to reach the conclusion. The purpose is to examine how OGC impacts CA and GP with the mediation of GI. A quantitative study is more reliable than a qualitative study; the current study is quantitative in nature. The survey method is a very common and effective method to collect primary data in this type of study. Primary data were gathered with the help of a structured questionnaire. The authors collected data from the manufacturing industry operating in the province of Punjab, Pakistan.

The authors contacted manufacturing businesses by physically visiting their offices to hand out surveys. Before the surveys were distributed, the managers were briefed about the study's objectives and relevance. Since managers are still active in the strategic decision-making processes, they were selected to gather data from. Furthermore, management not only has the pertinent data needed to put the strategies into action, but they also play an essential part in acquiring and disseminating knowledge.

The convenience sampling method was used. The data were analyzed using smart pls software. To ensure that variables are reliable and valid, a measurement model is employed. The study's hypotheses were tested using the structural model. According to Tabatchnick and Fidell (2001), a satisfactory number of respondents for a research study is 300. Out of 500 structured questionnaires issued to managers in various departments, only 319 were returned with full answers, yielding a response rate of 65.4%. In addition, the contributors enlisted the help of professionals to guarantee the questionnaire's conversion and content quality. Further, the survey's clarity, readability, and psychometric qualities were fine-tuned via pretesting on 30 different manufacturing businesses.

All constructs including OGC, GI, CA and GP were measured on 5 likert-scales. All the constructs are reflective in nature. All scale items to measure construct were taken from previous studies. OGC was measured by a 4-item scale, which was adopted from the study by Marshall et al. (2015). The four-items scale of Singh et al. (2020) was used for GI. For measuring CA, a 4-item scale is taken from a study by Chang (2011). GP is

measured with an 8-item scale, which was adopted from Chen et al.'s study (2006). A complete list of constructs, items, and sources is given in Table 1.

Table 1
Measurement of scales

Sr. No	Variable	Items	Source
1	OGC	4	Marshall et al. (2015)
2	GI	4	Singh et al. (2020)
3	CA	4	Chang (2011)
4	GP	8	Chen et al. (2006)

Results

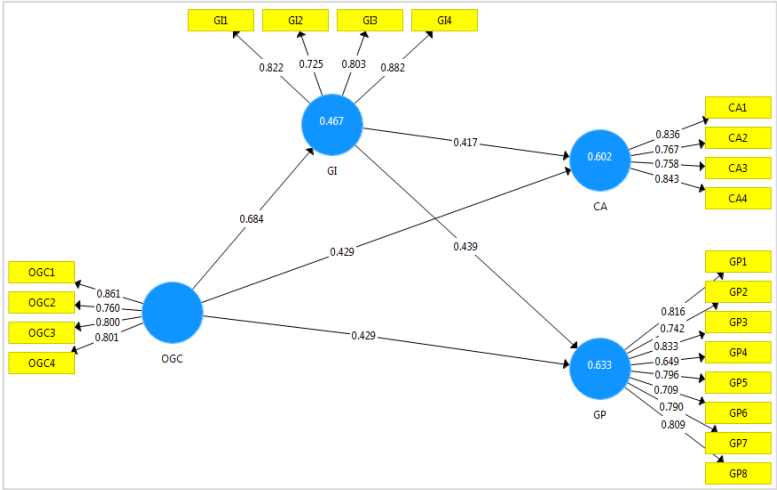
Demographic Information of Respondents

Most of the respondents were male (88.71%). Majority of respondents belong to age group 28–37 years (49.53%) and having bachelor degree (48.59%). A complete detail is given below.

Table 2
Demographic information

Question	Detail	Frequency	Percent
Gender	Male	283	88.71%
	Female	36	11.29%
Age	18–27	109	34.17%
	28–37	158	49.53%
	38–47	36	11.29%
	48 or above	16	5.02%
Level of Education	Matriculation	27	8.46%
	Intermediate	89	27.90%
	Bachelor	155	48.59%
	MS/M.Phil.	38	11.91%
	PhD	10	3.13%
Firm Type	Pharmaceutical	93	3.13%
	Cement	45	3.13%
	Food production	23	3.13%
	Textile manufacturing	158	3.13%

Figure 2
Measurement model



The measurement model is performed with the help of smartPLS_4 to check the reliability and validity of study variables. Factor loadings (Table 3) are in acceptable range. Factor loading above 0.4 is acceptable, but preferred is above 0.708. Items are removed if they cause the increase of reliability and validity of the construct. Here, reliability and validity are in acceptable range so there is no need to delete any item of the constructs. The variance inflation factor (VIF) values must be less than 5 and in this study all values of VIF are below 5 as shown in Table 3.

Table 3

Factor loadings and VIF

Construct	Items	Loadings	VIF
Competitive Advantage	CA1	0.836	1.855
	CA2	0.767	1.579
	CA3	0.758	1.521
	CA4	0.843	1.882
Green Performance	GP1	0.816	2.265
	GP2	0.742	1.830
	GP3	0.833	2.515
	GP4	0.649	1.480
	GP5	0.796	2.478
	GP6	0.709	1.721
	GP7	0.790	2.480
	GP8	0.809	2.234
Green Innovation	GI1	0.822	1.826
	GI2	0.725	1.490
	GI3	0.803	1.767
	GI4	0.882	2.147
Organizational Green Culture	OGC1	0.861	2.071
	OGC2	0.760	1.596
	OGC3	0.800	1.683
	OGC4	0.801	1.685

Notes: VIF, variance inflation factor.

The values of cronbach's alpha and composite reliability (Table 4) show a good reliability of the constructs. Average variance extracted (AVE) values of each must be greater than 5. The study shows that AVE values are in an acceptable range. Complete detail is given in Table 4. Discriminant validity is established with Fornell and Larker criterion, given in Table 5. The R2 values for CA, GP, and GI are 0.602, 0.633, and 0.467, respectively, and are given in Table 6.

Table 4

Reliability and convergent validity

Construct	Cronbach's Alpha	CR	AVE
Competitive Advantage	0.814	0.878	0.64
Green Performance	0.901	0.921	0.59
Green Innovation	0.825	0.884	0.66
Organizational Green Culture	0.820	0.881	0.65

Notes: CR, composite reliability; AVE, average variance extracted.

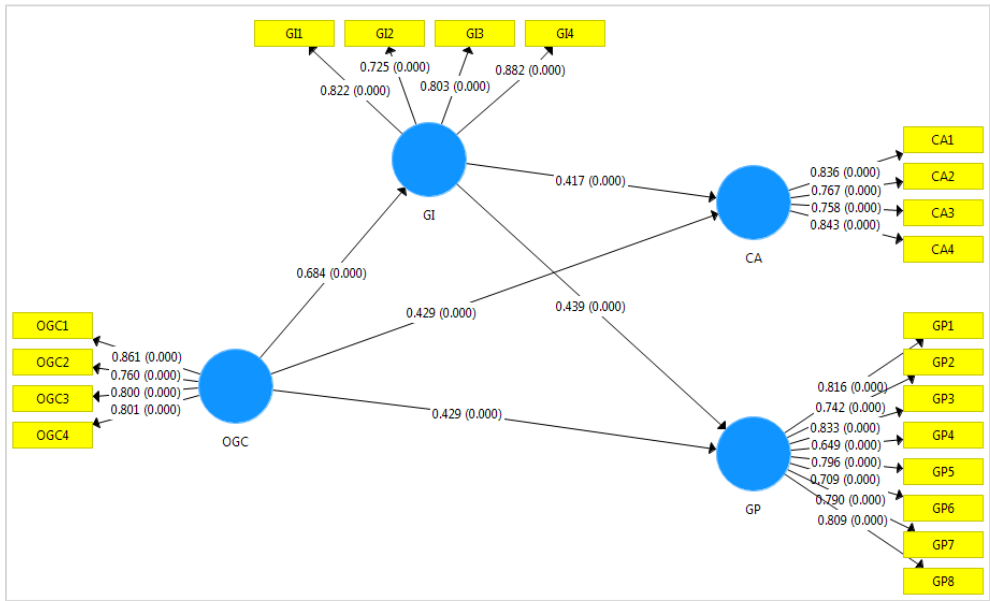
Table 5
Fornell and Larker Criterion

Construct	CA	GP	GI	OGC
CA	0.802			
GP	0.773	0.770		
GI	0.710	0.732	0.810	
OGC	0.714	0.728	0.684	0.806

Table 6
R-square

Construct	R Square	R Square Adjusted
CA	0.602	0.599
GP	0.633	0.631
GI	0.467	0.466

Figure 3
Structural model



The purpose is to explore the influence of OGC on CA and GP with the mediating effect of GI. H1 evaluates whether OGC significantly and positively affects CA. The study showed that OGC influences CA ($\beta=0.714$, $t=13.822$, $p=0.000$), so H1 was accepted. H2 evaluates whether OGC significantly and positively affects GP. Findings confirmed that OGC significantly and positively influences GP ($\beta=0.728$, $t=14.057$, $p=0.000$), so H2 was accepted. H3 evaluates whether OGC significantly and positively affects GI. The result found that OGC influences GI ($\beta=0.684$, $t=12.519$, $p=0.000$), so H3 was accepted. H4 evaluates whether GI affects CA. The study confirmed that GI influences CA ($\beta=0.417$, $t=4.025$, $p=0.000$), so H4 was accepted. H5 evaluates whether GI affects GP. The findings revealed that GI influences GP ($\beta=0.439$, $t=4.233$, $p=0.000$), so H5 was accepted. All direct relationships are given below in Table 7.

The hypotheses H6a and H6b examined the mediating role of GI among OGC, CA, and GP. The findings revealed that OGC has a substantial influence on CA and GP. Moreover, all direct hypotheses were significant. In addition, all indirect hypotheses were also significant. The study confirmed that GI acts as a mediator among links of OGC-CA ($\beta=0.285$, $t=4.018$, $p=0.000$), H6a, and OGC-GP ($\beta=0.300$, $t=4.306$, $p=0.000$), H6b. So, H6a and H6b were accepted. All hypotheses of the current study are accepted.

Table 7
Hypotheses testing

Construct	β value	SD	T statistics	P values	BCI [2.5%, 97.50%]
Total effect					
OGC -> CA	0.714	0.052	13.822	0.000	[0.574, 0.792]
OGC -> GP	0.728	0.056	14.057	0.000	[0.602, 0.814]
OGC -> GI	0.684	0.055	12.519	0.000	[0.567, 0.779]
GI -> CA	0.417	0.104	4.025	0.000	[0.207, 0.605]
GI -> GP	0.439	0.107	4.233	0.000	[0.232, 0.629]
Mediation Analysis					
OGC -> GI -> CA	0.285	0.071	4.018	0.000	[0.142, 0.423]
OGC -> GI -> GP	0.300	0.070	4.306	0.000	[0.164, 0.437]
Direct effects					
OGC -> CA	0.429	0.102	4.190	0.000	[0.225, 0.606]
OGC -> GP	0.429	0.105	4.290	0.000	[0.249, 0.626]
Indirect effects					
OGC -> GI	0.684	0.055	12.519	0.000	[0.567, 0.779]
GI -> CA	0.417	0.104	4.025	0.000	[0.207, 0.605]
GI -> GP	0.439	0.109	4.233	0.000	[0.232, 0.629]

Notes: OGC, OGC.GI, GI; CA, CA; GP, GP; β value, path coefficients; SD, standard deviation; BCI, bias corrected confidence interval.

Some researchers suggest that value of f^2 should be calculated for study framework. It explains that what will be change in the value of R^2 , if any independent variable (exogenous) removed from the framework (Götz, Liehr-Gobbers, & Krafft, 2010). This change can be small (0.02) medium (0.15) or large (0.35) vary from study to study (J. Cohen, 1998). The Q^2 value is known as predictive relevance which can be obtain by blindfold method in smartPLS. The researcher suggested that the value of Q^2 must not be zero, should be greater than zero (Chin, 1998). The Q^2 values for CA, GP, and GI are 0.381, 0.371, and 0.297, respectively. The values of f^2 and Q^2 are given below in Table 8.

Table 8
Effect size of the model (f^2) and predictive relevance (Q^2)

Construct	CA	GP	GI	OGC	Q^2
CA					0.381
GP					0.371
GI	0.232	0.279			0.297
OGC	0.246	0.267	0.878		

Discussion and Managerial Implications

That OGC can boost CA is demonstrated by this discovery, confirmed H1. In order for their company to stand out from the competition, managers should prioritize OGC and foster a culture that supports environmental values. In order to maintain a CA, managers can foster an organizational culture that prioritizes environmentally friendly manufacturing methods. This will help prevent negative consequences on the environment. When environmental issues emerge, these managers should be well-versed in their organization's environmental strategy, even though the current environmental protection demand isn't always amenable to manipulation. Their organization's commitment to green culture initiatives is an obvious factor in their CA selections. OGC impacted GP significantly, confirmed H2. A company's GP can be enhanced when managers are directed by an OGC that supports environmentally friendly ideals to be mindful of the resources used, trash produced, and energy consumed. Although we acknowledge that the current green environmental standards and the ever-

evolving technological landscapes pose a significant barrier, our findings nonetheless suggest that managers should embrace OGC traits. In order for a company to prioritize a green culture, it needs recruit managers who are passionate about environmental causes and who share the ideals of the company's green culture. Managers should behave in an environmentally conscious manner to increase their companies' GP in light of the present climate of stringent environmental laws and attitudes. This will help managers to open up new chances in the market. The study confirmed OGC provides a chance for managers to enhance GI in manufacturing companies, confirmed H3. In order to accomplish GI, managers should encourage and mold a green culture among their employees. This entails promoting the importance of a green culture within a company. For instance, in order to boost GI, managers must focus on green culture and work to instill green ideals among their employees. In a company that cares about the environment, managers should think about creating a green culture that helps its employees. When workers engage in a way that supports the company's green strategy, it helps to foster an organizational culture that encourages innovation in this area. GI is more likely to occur in firms with OGC since employees there are more inclined to take part in environmental protection efforts (Khazanchi et al., 2007). The study confirmed that GI has significant impact on CA and GP, confirmed H4 and H5. The results are similar to prior studies (Wang, 2019). Managers should prioritize GI to achieve CA and GP.

As best of our knowledge, there is a little research on mediating role of GI among OGC, CA and GP (Wang, 2019). Our discovery of the totally mediating impact of GI strategy is significant between links of OGC-CA (H6a) and OGC-GP (H6b). The ramifications for strategy are what make this finding so important. Superior competency and market pioneering, whether in technology or services, have always been the foci of innovation in order to increase innovation advantage. Our findings imply that managers have the power to shape innovation by advocating for the principles of harm reduction that underpin effective GI. Of course, for managers to make a difference, they need to set an example of sustainability. In terms of common principles, managers must fulfill specific standards for effective innovation and adaptation of environmental advancement. Managers are often compelled to employ OGC, which could contain this environmentally friendly innovation. According to our study, the link between OGC, CA and GP were partially mediated by GI strategies. Accordingly, OGC may have effect on CA and GP either directly or indirectly via GI, confirmed H6a and H6b. OGC has a direct impact on CA and GP. GI is still relevant because OGC may help sustain a CA and GP. It is true that the OGC should prioritize GI since being proactive in this area often results in a CA and GP. As a result, managers need to foster an environment within the company that encourages and rewards environmentally conscious innovation. The creation of OGC may help managers to attain CA and GP. GI, when integrated into an OGC, gives managers the power to open new avenues for the CA and GP of their organization. The study found that by focusing on green values (e.g. OGC and GI) help to achieve new prospects of market for the organization can get a CA and GP. A company can gain a CA and GP through sustainable innovation and effective management of natural resources through OGC (Gupta & Kumar, 2013; Wagner, 2006).

Theoretical Contribution

First, Prior study by Wang (2019) examine OGC on employee behavior level. We examine OGC on organizational level is a theoretical contribution to the literature. Second, the study confirmed that GI has ability to enhance GP and CA. In the organizational literature, the influence of culture on performance and CA is extensively studied (Deshpandé & Farley, 2004; Farley et al., 2008). GI acts as a mediator between OGC, GP and CA, although how exactly this works is poorly known. Our important results represent our addition to management theory. Most of the literature does not address OGC-CA and OGC-GP links through GI. Despite limited literature indicating the significance of environmental issues, no empirical investigation has yet taken them into account; the study contributes to knowledge on OGC, GI, CA and GP by filling that gap (for instance, cite Moreton et al., 2005; Sugita & Takahashi, 2015). Theoretically, this study's results reveal what company leaders should priorities OGC to achieve CA. This research provides a novel theoretical justification for the association by analyzing mediation of GI strategy. According to Klassen and Whybark (1999), OGC necessitates a middle ground between reducing manufacturing costs to conform to environmental requirements and boosting investment in eco-friendly technologies. For OGC enterprises to thrive in the GP arena, internal preparation is key. Given the unique nature of GP goals and the paramount importance of GI methods relative to other organizational strategies, it follows that GI is distinct from conventional innovation. Our findings cast doubt on the efficacy of organizational culture in influencing a company's GP in the absence of OGC as a foundation for GI. GI has piqued people's interest, and this study explains how OGC relates to certain performance metrics. One possible basis of a company's CA is its valuable, scarce, and hard-to-imitate resources, according to the resource-based viewpoint (RBV) (Barney, 1991). Our results indicate that organizational culture ought to center on environmental factors, contrary to most

studies that contend that it is based on logic of RBV (e.g. Kleinschmidt et al., [2007](#)). This conclusion builds upon earlier work by Russo and Fouts ([1997](#)). The NRBV lends credence to this idea since it posits that businesses need innovative resources to adapt to shifting market conditions.

Limitation and Future Research

Some limitations are providing directions for future investigations. The data only come from one country, which might make it hard to draw any broad conclusions from the study. Environmental restrictions in Pakistan are on top priority by govt. This is because Pakistan is a developing nation. Given this caveat, it will help researchers to examine the study's assumptions in different cultural and economic contexts (developing and developed nations), such as environmentally conscious nations that have recently undergone industrialization. A further limitation is that the data used in this study are cross-sectional. Longitudinal studies are necessary to determine how a OGC and GI impact GP and CA in the long run. In order to better understand these proposed links, researchers in the future should conduct longitudinal studies. Finally, there is the issue of where OGC differs from traditional culture in terms of its origins. The study utilized just one independent variable (OGC), future researchers can use other green aspects like green finance and green marketing etc. the study used only one mediating variable (GI) but future research can examine other variables as a mediator e.g. environmental performance. Convenience sampling method was utilized to collect data, but future researchers can use other sampling techniques e.g. snowball sampling and stratified sampling.

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