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Research paper



Sustainable Transport and Corporate Sustainability Performance: Moderating Role of Organization Age

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Abstract

Sustainability has been seen as a crucial issue that is being faced by many sectors in Malaysia which involves manufacturing sector. The Malaysian government has enhanced manufacturing organizations to apply green practices in the working environment to achieve corporate sustainability performance. In order for an organization to achieve corporate sustainability performance, the practices of the organization in using green technology such as sustainable transport is very important. The aim of this study is to examine the effects of sustainable transport on corporate sustainability performance with the moderating role of organization age. Drawing data from 130 Malaysia chemical manufacturing organizations, the model studies the moderating role of organization age on the sustainable transport and the corporate sustainable performance of the organizations. Partial Least Square (PLS) analysis is used in this study in order to analyze the data and the multistage sampling technique has also been used in this study. The results show that there is a positive relationship between sustainable transport and corporate sustainability performance. The results also suggest that organization age do not moderates the effect of sustainable transport and corporate sustainability performance. In achieving corporate sustainability performance, this study is important as it will guide employees in the manufacturing sector especially in chemical manufacturing organizations to practice the appropriate green practices such as sustainable transport.

Keywords: *sustainable transport, organization age, corporate sustainability performance, green technology, chemical manufacturing organization*

1. Introduction

Businesses not only give positive impact to the development of Malaysia but also give negative impact to the environment. Malaysia like other nations, is struggling with the need to balance demand of growing population with a natural environment that has many issues [1]. Climate change maintain as the biggest threat that straining economic inequalities, and affects economic and social development. Ecosystem services can be weakened by land alteration, over exploitation, biodiversity loss, the unsustainable use of land and illegal deforestation. It will then heighten the risk of climate disaster thus ruining ecosystem for the present and future generation [1]. In the recent past, corporate sustainability performance got much attention from the regulators, governments and practitioners in all over the world [2]. Green practices are important and need to be considered by all sectors as it may contribute to the corporate sustainability performance [1].

Malaysia like other developing countries are facing the sustainability issue which affect the economic, environmental and social aspect [3]. [4] stated that a powerful green sense of responsibility and social conscience have to be developed by the organizations which realize the importance of being green. [5] found that in developing countries there is not much inclination towards green practices even there is increasing consciousness among society. The effect of climate change is caused by human and it will create serious risks for economies and the quality of life of the communities (Ted, 2010). Climate change may causes risk to sustainable business which is a challenge to future generation.

Customers around the world are looking for governments and businesses that show leadership on climate change. Organizations around the world are challenged now to do their part to reduce greenhouse gas emission. Thus, it is important for businesses and government to apply green practices in combating the environmental problem in achieving sustainability. Sustainable transport is the green practice that is important in achieving corporate sustainability performance by involving the uses of green technology. Malaysia businesses are looking at green technology and innovation in facing the sustainability problem [6]. Green technology enhances the competitive advantage in achieving sustainability [7] as it reduces the negative effects on environment and the resource used [8]. Sustainable transport is important in achieving corporate sustainability performance as it has been highlighted in government plan. Malaysian government enhances all sectors including manufacturing sector to implement green practices in order to sustain [1].

The manufacturing sector is an important sector in Malaysia as it contributes to the high gross domestic product of the Malaysian economy [9, 10]. However, it shows that the environmental problems brought by Malaysia manufacturing industry resulted in negative effects towards economy, environment and social sustainability [10]. The impact of global warming, natural disasters, wars and environmental problems made a sustainable business in manufacturing a crucial issue. [11] stated that the highest number of occupational accidents occurred in manufacturing sector [1].This is supported by [12] that chemicals present in many products in our daily lives which potentially give negative impacts towards the sustainability such as to health and the environment. According to [1], in order to achieve corporate sustainability performance,

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it is a need for an organization to has a proper implementation of green practices. Thus, the aim of this study is to examine the effects of sustainable transport on corporate sustainability performance with the moderating role of organization age.

2. Literature Review

2.1. Green Technology in Malaysia

In recent years, Malaysia has given greater consideration to sustainable development and thus encouraging organizations to embrace green policies and technology [1]. The establishments of The Ministry of Energy, Green Technology and Water on April 9, 2009 prove that Malaysia firmly believes national efforts are important in order to achieve the sustainable development [13]. In Malaysia's long-term development plans, sustainable economic development is crucial and green technology has been viewed as the catalyst for economic growth [13]. The sustainability of economic, social and environmental aspects, as well as efficient utilization and energy interdependent can guarantee sustainable energy growth in the future [13]. Malaysia is promoting green practices as it might enhance the buildings constructions, transports, product s and services that have a low amount of carbon and using energy effectively [1].

2.2. Green Practices

In the 1990s, organizations understood that green image for the overall business operations and products may contribute to a competitive advantage and reputation gain with respect to the competition [14]. At the end of the 20th century, the notion of green business emerged in the wake of the ever increasing public concern on the sustainability of economic development [15]. There is a growing awareness of environmental issues such as the deterioration of environmental quality and the accelerating depletion of the natural resources. In the middle of 1960s, the green movement's origins can be traced down and it took 20 years for businesses to adapt the trends of greening and to adopt them into practice [15]. Recently, Malaysia enhances organizations in various sectors to implement green practices by encouraging business to embrace the green policy and technology [1, 9]. The implementation of green practices has been seen as an important agenda for the benefits of Malaysia. There are many agencies who involved in fostering the green practices in Malaysia such as the Ministry of Energy, Green Technology and Water and Malaysian Green Technology Corporation [13]. As stated by [13], Malaysia takes a committed step by establishing the National Green Technology Policy in 2009 which aims for the development of green technology. In encouraging key industries to be environmentally friendly, various forms of green incentives for environmental conservation were introduced which include areas connected to renewable energy, purchase of green technology equipment, Green Building Index certificate, recycling, treatment and disposal of toxic and hazardous wastes, conservation of energy, research and development, biotechnology and storage [9].

2.3. Sustainable Transport

It is one of the efforts of the Malaysian government in enhancing the uses of sustainable transport in achieving corporate sustainability performance [1]. [16] stated that the ability of transport to supply the source energy indefinitely and transport that is sustainable in the sense of climate impacts, social and environmental is referring to the broad subject of sustainable transport. Any form of transport that does not use or rely on dwindling natural resources is known as sustainable transport and green transport [17]. The climate impacts of the system and the environment, as well as the transportation system efficiency and effectiveness is largely used to measure the sustainability of transportation [16]. [17] stated that rather than relies on fossil fuels that have a finite life expectancy, sustainable transports rely on regenerated or renewable energy. Therefore, since it makes use of sustainable energy sources, it is said to have a low or a negative effect on the environment. The excellent examples of sustainable transport are walking, cycling and sailing [17]. According to [1], by enhancing transport that is low carbon using the utilization of public transportation and energy efficient vehicle, sustainable transport can be achieved. The benefits of green transport are; generate less noise, cuts operating cost, reduces fuel consumption, traffic congestion and air pollution and improves customer and public relationships.

2.3. Corporate Sustainability Performance

There is no common definition of corporate sustainability [18, 19]. Corporate sustainability refers to a dynamic state that arises when the organization develops continuous shareholders and stakeholders' value which maintains the well-being of the economy, environment and society for a long-term goal [10, 20]. It is being described as performing activities in a situation that fulfil the needs of current generations without neglecting the needs of the generations in the future [21]. According to [18], corporate sustainability is essential in achieving organization's vision without losing competitive advantage while ensuring companywide economic growth, environmental stewardship and providing social responsibilities without contradicting from its mission and goals. [22] agreed that corporate sustainability performance measures the extent to which an organization embraces governance, social, environmental and economic factors into its operations and the impact they exert on the organization and society ultimately. As stated by [23], corporate sustainability performance can provide competitive advantages to the organization as it will increase savings, revenues and efficiencies which place organization position better than its competitors. Executives, stakeholders and employees must take the initiatives and responsibility in transitioning towards a sustainable world [23]. For organizations, it implied the challenge to simultaneously improve social and human welfare while reducing their environmental impact and ensuring the effective achievement of organizational objectives [24].
In practice, corporate sustainability can be implemented by managing economic, natural and social capital [25]. A sustainable organization requires all capitals to be maintained and ideally increased. The components of corporate sustainability performance are the triple bottom lines which are economic sustainability, environmental sustainability and social sustainability [25-27]. According to [14], the term "triple bottom line" which gains popularity was introduced by [28]. Traditionally, an organization's performance is measured by using one bottom line which refers to net income or profit and thus the triple bottom line includes additional bottom lines for environmental and social performance [14]. It also refers to a state that arises when the organization develops continuous shareholders and stakeholders value which maintaining the well-being of the economy, environment and society for a long-term goal [10]. [28] defined sustainability as the enlargement of the perspective towards the corporation which considers the triple bottom line that consist of economic, environmental and social dimensions. According to [29], economic performance is the organization's effects on its stakeholder's economic condition as well as domestic, national or international level economic systems. [1] stated that environmental sustainability relates to practices that contribute to the quality of the environment on a long term-basis. Meanwhile, the social performance of corporate sustainability performance is about the situation of maintaining or enhancing the existing social welfare for the generations in the future [30]. Figure 1 below shows the triple bottom line concept proposed by [28].

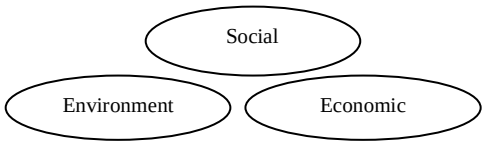


Fig.1: The Triple Bottom Line concept proposed by [28]

2.3.1. Economic Sustainability Performance

The main function of any business is to create shareholder value through continuous sustainable economic performance [31]. Economics is concerned with the ways in which human beings produce and distribute the goods and services that they need and desire [23]. According to [29], economic performance is the organization's effects on its stakeholder's economic condition as well as domestic, national or international level economic systems. At the organization level, economic performance shows the impact of business on stakeholders' economic conditions, economic systems at the local up to international levels [29]. The economy provides solutions and methods to invest in protecting the environment and conservation of natural resources as well as to sustain society[32].

2.3.2 Environmental Sustainability Performance

In order to effectively compete in the global market, organization worldwide should integrate environmental sustainability into their business strategies and model [31]. International Organization for Standardization defined environmental performance as how the environment is affected by the management of the organization [1]. It addresses an organization's effects on the qualities of the living and non-living system, including, land, air and water. [1] stated that environmental sustainability relates to practices that contribute to quality of the environment on a long term-basis.
Examples of organization practices include recycling programs, carbon emissions reduction programs and programs for waste management [1]. The environment is like other forms of capital as it delivers essential inputs into consumption and production and it can be thought as a natural capital [33]. Environmental sustainability performance is achieved by green practices that is manageable in terms of declining of waste of manufacturing organization and the disposal in an appropriate way and the appropriate way of managing of non-renewable resources and consumption of energy [30].
There are four key segments within the environmental performance which are energy use, non-product output, pollutant release and material use [34]. According to the [1], environmental policies should improve social economic efficiency and social welfare by reducing environmental bad and excessive pollution. The challenge for sustainable business management is to pursue profit in ways that contribute to, rather than threaten the environment sustainability [23]. Thus, to effectively compete in global market, organization worldwide should response to environmental challenges and turn them into opportunities that change their environmental management, policies and practices to safeguard the global environment and improve related performance [31].

2.3.3 Social Sustainability Performance

The implementation of an organization's mission in terms of social values involving societal happiness by fulfilling the social obligations is known as social performance [31]. In term of human capital, social sustainability is about good practices such as providing and maintaining a safe work environment, employees welfare, benefits and compensation as well as in training and development. [1] agreed that corporate performance is linked with social performance in terms of the operation of an organization. Social effects of product, occupation, moral sourcing and community relations are the four key segments in social performance [34]. The obligations to react excellently to social and stakeholder issues in societal obligations are through the integration of social considerations into the activities [31].
[1] stated that the examples of Social issues that can be taken into considerations are working conditions, non-discrimination, freedom of association and collective bargaining, health and safety at work. Social capital development, community engagement and engaging communication that aims to be inclusive are some of the core ingredients which are suggested for the sustainability of the organizations [35]. According to [36], as a foundation for sustainable business patterns, organizations can establish long-run employee, individual and consumer trust by concentrating on their social responsibility. If the business of organizations is to be sustainable, developing social capital is critical. This includes the network, relationships and connections which organizations cultivate and which are important to their internal and external operations[35].

2.4. Sustainable Transport and Corporate Sustainability Performance

[37] found that sustainable transport enhances the environmental performance. A sustainable transport protects the environment by minimising natural resource consumption and any disruption of vital habits and actively reduce transport-related emissions and wastes [38]. Positive economic outcomes, health and environmental are the benefits of sustainable transport such as for cycling and walking as both access and stand-alone modes of travel [39]. A sustainable transport system is designed and operated in a way that minimizes hazards to health, the incidence and fear of transport-related crime, and the numbers, severity and risks of traffic accidents which contribute to economic growth [38].
Moreover, there are significant co-benefits of active travel modes due to their roles in climate change mitigation and health as sustainable transport linked to improving public transport or designed for active health specifically [39], Based on the study of [40], sustainable transport has been chosen most by the passenger as the environmental preferences is found to be important in achieving sustainability.

2.5. The Moderating Role of Company's Age on Sustainable Transport and Corporate Sustainability Performance

There are many researchers who found that the age of the organization has an effect on the growth of the firm [41]. [42] study show that green practices are more important for middle-aged firms. According to [42], it is important for organizations that have reached the maturity stage to apply green practices as it gives many advantages to the organization in terms of the efficiency and cost savings. [43] concluded that the proactivity in meeting the environmental requirements shows a positive effect on firm performance in the long term. According to [44], the longevity of the business gives the company expertise and adequate competence to improve the impact on company performance and firm age can influence the development of environmental innovations.

3. Research Gap in the Literature

According to [10], in order to update information and fully understand green issues in Malaysia, constant study is needed as this issue is still developing and new. In the context of Malaysia, little is known about the implementation of green practices in achieving corporate sustainability performance [9, 10]. Based on the review of the relevant literature it was found that there is not much research in the area of green practices and corporate sustainability performance [9]. There is a need for conducting research on green practices and organization performance as the empirical research of green practices on organizational performance is lack [45].

It has been a topic of great concern for scholars and practitioners from all over the world to explore the significance of green practices in the development of a sustainable business culture [46]. It is noted that there is a relative lack of research on the theme green practices and its initiatives in business [47]. Even today, the green business practices are still far from being universally embraced and applied by business entities around the world as it is still largely perceived as an extra burden in terms of cost increase or revenue loss [15, 46]. These practices supports the government plan to become an advanced economy by 2020 in achieving a resilient, low-carbon, efficient in term of resource and socially-inclusive manner [1].

Moreover, this study is important as there are limited studies which simultaneously study the three dimensions of corporate sustainability performance (which are the social, environmental and economic dimension) in considering the effect of green practices applied in the manufacturing organization on the corporate sustainability performance [7, 9, 48]. Hence, this study is important as it focuses on all dimensions of corporate sustainability performance as most of the previous studies focus on the three dimensions separately [2]. Besides, there are fewer studies which focused on the effects of green practices on corporate sustainability performance in the manufacturing sector [9] especially in the Malaysia context [49]. The study is carried out using the following research framework as in Figure 1 in order to close the research gap in the study.

4. Research Methodology

The chemical manufacturing industry has been chosen in this study due to the high sustainability issues occurred in this industry [50]. Employees from middle to top level management have been selected as the sample. Questionnaires were distributed to the employees in 130 chemical manufacturing organizations which were listed in the Federation of Malaysia Manufacturing. In order to guarantee the content validity of the measurement in this study, discussions have been done with the experts in the Partial Least Square (PLS) analysis has been used in this study in order to analyze the data and the multistage sampling technique has been used in this study. Second generation techniques have been used increasingly by many researchers to overcome the first-generation techniques[51]. Structural equation modeling is a second generation techniques which enables researchers to incorporate unobservable variables measured indirectly by indicator variables. [52] stated that structural equation modeling facilitates accounting for measurement error in observed variables. This study use PLS-SEM because it gives many advantages to the researcher such as generally achieves high levels of statistical power, no distributional assumptions and it minimizes the amount of unexplained variance [51].

The proposed hypotheses are as below:

H1: There is a significant effect of sustainable transport on corporate sustainability performance.

H2: There is a significant effect of organization age on corporate sustainability performance.

H3: Organization age moderates the relationship between sustainable transport and corporate sustainability performance.

Research framework

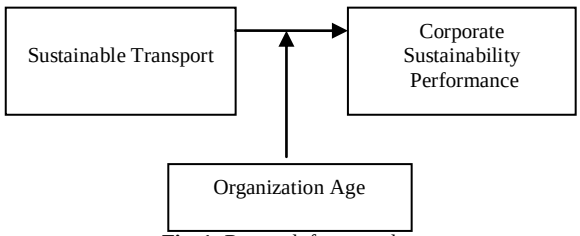


Fig. 1: Research framework

5. Results and Discussion

5.1. Organization Profile

This study analyzed 130 organizations. There are nine types of chemical manufacturing that has been classified by Federation of Malaysian Manufacturing. Based on the 130 organizations the highest number of types of chemical manufacturing is other chemicals products that are not elsewhere classified which is 26.2% and follows by soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations (20.8%). The highest percentage for organization size is 47.7% which is 74 and below (small) and the lowest is 23.1% which is 201 and above (large). For the operational period, the highest percentage is 41 and above (year) which is 84.6% and the lowest is 31 to 40 (year) which is 0.8%. Table 1 below shows the organization's demographic profile.

Table 1: Organization's Demographic Profile

Demographic	Frequency	Percentage
Types of Chemical Manufacturing		
1) Basic chemicals, except fertilizers and nitrogen compounds	6	4.6
2) Fertilizers and nitrogen compounds	1	0.8
3) Plastics in primary forms and of synthetic rubber	4	3.1
4) Pesticides and other agro-chemical products	5	3.8
5) Paints, varnishes and similar coatings, printing ink and mastics	17	13.1
6) Pharmaceuticals, medicinal chemicals and botanical products	11	8.5
7) Soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations	27	20.8
8) Other chemical products not elsewhere classified	34	26.2
9) Man-made fibres	0	0
10) Mix of types	25	19.2
Number of Workers (Size)		
74 and below (Small)	62	47.7
75-200 (Medium)	38	29.2
201 and above (Large	30	23.1
Operational Period (Year)		
10 and below	6	4.6
21 to 30	13	10.0
31 to 40	1	0.8
41 and above	110	84.6

5.2. Reliability

Composite reliability is used to measure the internal consistency. According to [53], composite reliability should be 0.7 or higher. Table 2 shows that the value of composite reliability (CR) is higher than 0.7 and it shows that all variables used in the study are reliable.

5.3. Convergent validity

Table 2: Convergent Validity

First-Order Construct	Second-Order Construct	Loading		AVE	CR
Sustainable Transport (ST)		ST10	0.921	0.716	0.958
		ST2	0.808		
		ST3	0.767		
		ST4	0.870		
		ST5	0.833		
		ST6	0.811		
		ST7	0.904		
		ST8	0.827		
		ST9	0.864		
Organization Age		OA	1.00	1.00	1.00

Economic Sustainability Performance		EP10 0.772 EP2 0.755 EP3 0.809 EP5 0.740 EP6 0.832 EP8 0.842 EP9 0.822	0.635	0.924
Environment Sustainability Performance		ENP1 0.722 ENP2 0.801 ENP4 0.762 ENP5 0.731 ENP6 0.755 ENP7 0.843 ENP8 0.742 ENP9 0.821	0.607	0.925
Social Sustainability Performance		SOP10 0.789 SOP2 0.744 SOP3 0.737 SOP4 0.811 SOP5 0.858 SOP6 0.723 SOP7 0.771 SOP8 0.785 SOP9 0.762	0.603	0.932
	Corporate Sustainability Performance	Economic Sustainability Performance 0.946 Environment Sustainability Performance 0.924 Social Sustainability Performance 0.926	0.491	0.958

Note: Items ST1, EP1, EP4, EP7, SOP1 and SOP10 were d the loading below 0.7.

According to [54], convergent validity is the degre multiple items to measure the same concept are in ag order to assess the convergent validity, [55] suggeste factor loadings, composite validity and average varian The suggested loadings values for all items are 0.7 or et al., 2014). Therefore for this study, 6 items that l below 0.7 were deleted. Hence, items ST1, EP1, EP4, and SOP10 were deleted due to the low loading. Fron is found that most of the constructs achieve converger all of the average variance extracted (AVE) values are the acceptable threshold of 0.5 [56]. However, t corporate sustainability performance which is 0.491 i as according to [56], even though the AVE is lower t composite reliability (CR) is greater than 0.6 it is a acceptable.

5.4. Discriminant Validity

Discriminant validity is the degree to which items among constructs or measure distinct concepts [54]. The discriminant validity is assessed through the Fornell-Larcker criterion which is shown in Table 3. It can be seen that the square root of the AVE for each construct is higher than its correlation with any other construct [57]. Based on this analysis, it could be interpreted that those constructs have discriminant validity and thus asserted as valid.

Table 3: Discriminant Validity

Variable	Age	CSP	ST
Age	**1.00**		
CSP	-0.04	**0.701**	
ST	-0.169	0.583	**0.846**

5.5 Structural Model

Figure 2 below shows the structural model of sustainable transport and corporate sustainability performance with the mediating role of organization age. From the analysis, it is found that sustainable transport (β=0.584, p<0.01) is positively related to corporate sustainability performance. [39] found that positive economic outcomes, health and environment are the benefits of sustainable transport. Sustainable transport protects the environment by minimizing natural resource consumption and any disruption of vital habits and actively reduces transport-related emissions and wastes[37, 38]. Table 4 below shows the summary of the analysis of the hypotheses results. The results show that organization age and corporate sustainability performance has a negative relationship (β=0.078, p<0.01). Bootstrapping procedure has been used in this study which has been suggested by the literature and the results show that there is no moderating effect of organization age on sustainable transport and corporate sustainability performance. The interaction effect is not significant (β=-0.095, p<0.1). This study is supported by [58]. According to [58], firm age has a negative effect on environmentally responsible participation as younger firms present better environmental responsibility than older firms due to the older firms tend to have poorer environmental facilities than younger firms.

Table 4: Hypotheses Results

Hypotheses	Std. Beta	Std. Error	t-value	Decision
H1: ST -> CSP	0.584	0.063	9.305**	Accepted
H2: Age -> CSP	0.078	0.07	1.116	Rejected
H3: ST*Age*CSP	-0.095	0.089	1.072	Rejected

Notes: **p<0.01

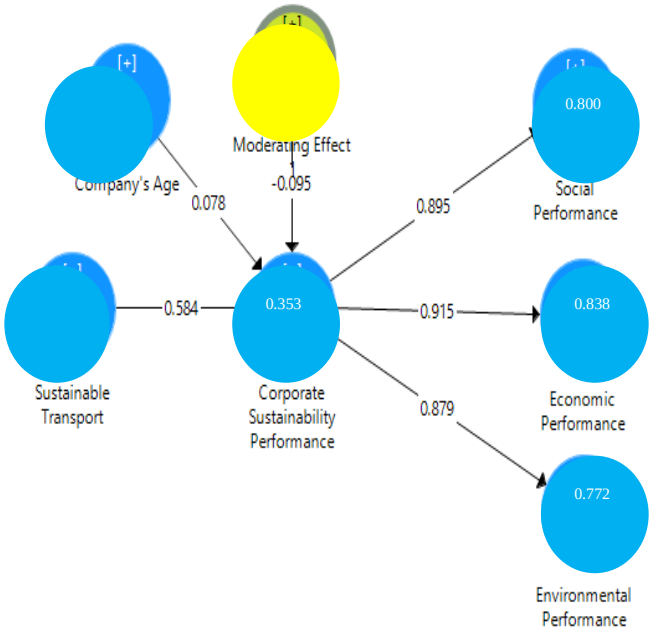


Fig. 2: Structural Model

6. Conclusion

It is important for manufacturing organizations to implement sustainable transport in the work processes in achieving corporate sustainability performance as it has been highlighted in the government plan. The objective of this study is achieved by investigating the effects of sustainable transport on corporate sustainability performance with the moderating role of organization age. Organization age does not have a significant moderating effect on the relationship between sustainable transport and corporate sustainability performance. Thus, this study will enhance the body of knowledge of sustainable transport and corporate sustainability performance along with the moderating effect of organization age. Moreover, in achieving corporate sustainability performance, this study is important as it will guide employees in the manufacturing sector especially in chemical manufacturing organizations to practice the appropriate green practices such as sustainable transport. Besides that, this study also contributes to the literature by studying the moderating effect of organization age on the relationship between sustainable transport and corporate sustainability performance in the chemical manufacturing organization.

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