

The nexus between management control systems, firm performance, green innovation and social media networking in Indonesian real estate companies

Ida Farida

Accounting Study Program, Harapan Bersama Polytechnic, Tegal, Indonesia and Faculty of Economics and Business, Accounting, Sebelas Maret University, Surakarta, Indonesia, and

Doddy Setiawan

Faculty of Economics and Business, Accounting, Sebelas Maret University, Surakarta, Indonesia

Received 29 April 2023
Revised 23 October 2023
Accepted 21 March 2024

Abstract

Purpose – This study aims to explore the correlation between Management Control Systems, Green Innovation, Social Media Networks, and Company Performance in medium-sized construction and real estate firm in Indonesia.

Design/methodology/approach – This research method uses quantitative approach. The sample selection technique uses simple random sampling. The analytical method in this study uses structural equation models based on variance. Statistical test tool used, is Smart PLS 3.0.

Findings – The management control systems have a significant and positive impact on social media networks, green innovation, and company performance in the upper-middle-class construction and real estate businesses in Java. Furthermore, social media networks and green innovation were found to mediate the strong relationship between management control systems and firm performance in medium-sized construction and real estate businesses in Java.

Research limitations/implications – This research should provide a detailed, technical, and structured explanation of how companies assess suitability standards for implementing green innovation in Indonesia's construction and real estate sectors.

Social implications – The finding emphasize the importance of the management control system in enhancing firm performance. If, the elements of the management control system are met or adequate, it can improve the performance of those in charge, leading to satisfactory performance.

Originality/value – This finding is the first of its kind in Indonesia. It will contribute to shaping future development policies for government and private projects, ensuring they are more advance and environmentally conscious.

Keywords Management control system, Green innovation, Economic development

Paper type Research paper

1. Introduction

The importance of long-term environmental sustainability has led to efforts to reduce the environmental impacts to constructing new buildings (Miller, Pogue, Gough, & Davis, 2020).

JEL Classification — Q01, F63, G32, O36

© Ida Farida and Doddy Setiawan. Published in *Innovation & Management Review*. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licences/by/4.0/legalcode>



The construction industry is one of the most regulated industries and is increasingly subject to stricter rules regarding environmental impact (Voland, Saad, & Eicker, 2022). According to the World Green Building Council, construction and the energy used in building operations account for around 40% of global carbon emissions. The construction industry attracts of much of criticism worldwide. The principal areas of concern are air, water, and noise pollution. The call for outstanding sustainability drives, leading companies to start making changes and innovations by developing green buildings through a green innovation approach (Ma, Hong, Chen, & Quan, 2022).

Green buildings are buildings that are environmentally responsible and resource efficient throughout their entire life cycle. It includes – design, construction, maintenance, renovation, and demolition (Meng *et al.*, 2018). The building also considers the impact on the environment and the quality of life for buildings occupants at every stage of the building's life cycle (Miller *et al.*, 2020). Harmless, reusable, and recyclable building materials are used when constructing buildings (Voland *et al.*, 2022). They also use renewable energy, such as solar, and efficiently utilize of energy, water, and other resources (Al-Shetwi, 2022). Green building is a philosophy and practice of project management and related construction. Its main goal are: (1) Minimize or eliminate the impact on the environment, natural resources and non-renewable energy sources for the sustainability of the built environment; (2) improve the health, welfare, and productivity of residents and the entire community; (3) foster economic development and financial benefits for developers and the entire community; and (4) apply a life cycle approach to future community planning and development (Meng *et al.*, 2018).

Organizations that demonstrate strong environmental performance will earn a positive reputation and credibility from the community. It is essential because aligning with society's expectations, ecological preservation has become a key organizational goal (Szumilo & Fuerst, 2020; Zeadat, 2022). Therefore, there is a need for a management control system mechanism, and it is in the hand of audience to ensure the effective and responsible implementation of green innovation, including green process innovation and green product innovation (Zhang, Liang, Feng, Yuan, & Jiang, 2020). Innovation requires a significant investment and of time and money. The main goal purpose of implementing green innovation is to promote the effective and efficient use of raw materials. The organization's management control system is crucial for managing accounting activities, from planning to control processes (Ruiter, De Feijter, & Wagenveld, 2022). The traditional management control system, which is mainly based on accounting, is widely recognized as a valuable tool to support Small and Medium-sized Enterprises (SMEs) in guiding business development (Cosenz & Noto, 2015). Its implementation can be done through the levers of control mechanism (LOC) (Epstein, 2018). LOC consist of four key processes that are carried out simultaneously and systemically in organizational control, which include beliefs, limit, diagnostic, and interactive control (Harris, Herzig, De Loo, & Manochin, 2019). Environmentally-based LOCs are referred to as levers of ecological control (LOECs), serving to ensure the implementation of environmentally- based strategies into environmentally- based practices (Rehman, Bhatti, Kraus, & Ferreira, 2020).

Green innovation, an environmental strategy that can be implemented to develop a business without violating government regulations (Zhang *et al.*, 2020), is a transformative force within companies. It introduces more environmentally focused ideas, tools, or methods for small and medium-size enterprise SMEs, so that green innovation, is defined as a “transformational innovative capabilities” within companies (Iqbal & Suzianti, 2021; Sezen & Çankaya, 2013). The company encourages the use of Green Innovation to help protect the environment in a sustainable way. Green Innovation refers to revolutionary environmental innovations in practices, processes, management, and marketing. These innovations are a result of implementing Green Supply Chain Management and have led to improved environmental performance within the organization (Huang & Li, 2018).

The green building market in Indonesia is projected to reach \$18.5bn by 2021, showing a 4.0% growth from 2020. From 2017 to 2020, the market has kept a compound annual growth rate of 6.3%. Companies can use this significant opportunity by leveraging social media networks to enhance their performance (Latifah, Setiawan, Aryani, Sadalia, & Al Arif, 2022). Social media platform can serve as avenues for product promotion. Previous research has affirmed the impact of social media on innovation and value in today's business operations (Pratono, 2017). Therefore, social media networks play a vital role in keeping a company's sustainability. Obviously, social media is not only used for communication activities, blogs, forums, or other activities. However, social networking sites can also be used for commercial and can generate profits, because social media is also a means of communication without time and space restrictions (Hana, Sha, & Bohlin, 2021).

The first type of social media is Facebook (Wirtz, Tucker, Briggs, & Schoemann, 2021). The social networking site is one of the most widely used media in the world. Facebook is also one of the most frequently used social media by Indonesians (Wijaya, Darmawati, & Kuncoro, 2020). Its user-friendly attract many people to the platform. In Indonesia, Facebook is widely used to promote several types of products. Thus, products are more likely to be accepted and recognized by consumers globally and not just locally. Then, there is also a feature to host products, which is commonly called a marketplace platform. This platform makes it quite easy for a businessperson to create his own online shop website. Register an account and product through the marketplace provided by Facebook; then one can start doing online buying and selling transactions smoothly and systematically. In addition, social media networks also offer a platform to interact more closely with customers, and this certainly provides benefits for entrepreneurs in terms of fulfilling the tastes of innovation that are in demand by customers and fulfilled by companies (Latifah *et al.*, 2022).

Companies that are part of the green trend (green innovation) and integrate it into their business policies are seen as the companies that will lead the way in the future (Brandl & Zielinska, 2020). A company's increase ability to innovate also affects its performance (Corral de Zubielqui, Lindsay, Lindsay, & Jones, 2019). Firms that access the factors determining innovation capability; by actively using external knowledge; are also likely to have a positive impact on their firm's performance (Agustia, 2020). Innovation and technology support are needed to build better, faster, and cheaper infrastructure (Farida & Setiawan, 2022). Appropriate, effective, and environmentally friendly use of technology is also encouraged to create added value and sustainable development; so that the future generations can feel the benefits of infrastructure (Ma *et al.*, 2022). Green innovation is more than a concept for sustainable living; it can build hope for the future. Therefore, Indonesian people must be more aware of the importance of Green Innovation.

This study is driven by the limited research on green innovation and social media in real estate companies and contractors in Indonesia. The main aim of this research is to investigate the connection between Management Control Systems, Green Innovation, Social Media Networking, and Firm Performance in medium-sized construction and real estate companies in Indonesia. This study also marks the first of its kind in Indonesia. Its offers insight for formulating development policies for both government and private projects in the future, ensuring that they are more efficient and environmentally friendly.

2. Theoretical framework and hypothesis development

2.1 Green innovation

Green Innovations can help a company grow and persuade investors, employees, and suppliers to support its sustainability (Dai & Xue, 2022). When companies innovate with green products, they aim to use resources more efficiently, which can improve the production process. The greater the efficiency of a company in its business operations, the lower its

operating costs and the higher its financial performance, thereby improving firm performance (Tang, Walsh, Lerner, Fitza, & Li, 2018). Green innovation is divided into product and process categories (Dai & Xue, 2022; Khan, Kaur, Jabeen, & Dhir, 2021). Green product innovation involves creating new products or services that have no adverse effects on environment. On the other hand, green process innovation aims to enhance existing production processes by utilizing eco-friendly technologies to produce goods and deliver services that minimize harm to the environment.

2.2 Social media networking

Social Media makes this recognition process more accessible than ever (Femenia-Serra, Gretzel, & Alzua-Sorzabal, 2022). It makes it easy for consumers to provide feedback about the business offered. Social media for business also gives management broad access to positive and negative consumers feedback and, valuable information from the consumer's point of view (Malesev & Cherry, 2021). Social media can also make valuable information from competitors easier, which can improve the company's business strategy. With this method, management can also analyze the techniques used by competitors and do better than what they are doing. Social media can also reach anyone who uses it, regardless of whether it is a potential customer or another business that needs business services or products (Vale, Barbosa, Bertuzi, Bandeira, & Vale, 2021). This form of communication is more viable through social media than conventional marketing techniques (Malesev & Cherry, 2021).

2.3 Management control systems

The management control systems used in Indonesia companies tend to favor interactive approach over a diagnostic approach (Farida & Setiawan, 2022). This preference is closely linked to Indonesian culture, which highly values group problem-solving. The four forms control systems, also referred to as the levers of control are; belief systems, boundary systems, diagnostic control systems, and interactive control systems (Rodrigues, Alves, Oliveira, Vale, & Silva, 2021). The effectiveness of these control systems in business strategy is achieved by combining the four elements of the levers of control. This combination means that the strength of these elements lies in their combined use rather than their individual use. Planning the use of resources from the surrounding environment, both physical and social, can have a positive impact on the company. It also involves devising ways to process and preserve resources so they can continue to be used in the future. However, the role of the management control system goes beyond resource management. It is also crucial for companies to promote environmental friendliness and embrace true green innovation, aiming to prevent or reduce negative impacts on the environment.

2.4 Management control systems, firm performance, green innovation and social media networking

Implementing a management control system is crucial for a company's performance. It is the main tool managers should use to plan, budget, analyze, and evaluate information, which help in making the correct decisions (Ejiogu & Jain, 2012). This control system also helps manage and create innovations to achieve predictable goals and balance the fundamental organizational dilemma between control and flexibility.

Green Innovation is an environmentally friendly concept implemented by the company that saves energy from the production process to the formation of a product by saving the use of raw materials and efficient use. This can lead to direct saving in the company's production costs. Therefore, every organization needs a management control system because such a

system is designed to regulate the activities of all organization members by objectives desired by the company (Farida & Setiawan, 2022).

The company can benefit from cost savings in production, which can improve firm performance. According to research on business policy, disclosing firm performance is crucial for stakeholders (Khan, Ponce *et al.*, 2021; Mishra, 2017). Additionally, previous studies have shown that Green Innovation has a positive impact on improving firm performance (Lin, Cheah, Azali, Ho, & Yip, 2019; Tang *et al.*, 2018; Xie, Wang, & Zhao, 2022).

The company thrives and grows with strong management, proper planning organization, action, and control, all of which are guided by the company's management control system (Wong, Wong, Boon-Itt, & Tang, 2021). Social media serve as a communication medium that enables entrepreneurs to synthesize information and knowledge to foster innovation (Latifah *et al.*, 2022). The relevancy of the interplay between social media networks and innovation has been the subject of debate among various researchers (Latifah *et al.*, 2022; Regona, Yigitcanlar, Xia, & Li, 2022; Vale *et al.*, 2021). The collective findings write down that social media networks have a significant impact on innovation (green innovation).

Another benefit of participating in social media is building reputation and career opportunities, and generating direct monetary income (Latifah *et al.*, 2022). Social media has also fueled a new set of business models that challenge traditional business processes and operations (Ruiz-Real, Uribe-Toril, Torres, & Pablo, 2021). The difference that stands out is that one-to-one mass customization is becoming the norm in business transactions, replacing the one-to-one marketing promotion model. Social networks can also be used a tool that facilitates intra- and inter-organizational activities between co-workers, customers, business partners, and organizations (Dwivedi *et al.*, 2021). Building social network connection can involve creating remarkable and unique relationships through which companies can collaborate with potential customers and suppliers to develop products that meet customer needs (Brandl & Zielinska, 2020). Companies that employ differentiation strategies may also be motivated to create these relationships with customer. Different strategies force companies to offer a range of innovative products adapted and personalized to meet customer desires and satisfy them (Haseeb, Lis, Haouas, & Mihardjo, 2019). The hypotheses of this study the following.

- H1.* Management control system influences firm performance
- H2.* Management control system influences green innovation
- H3.* Management control system influences social media networking
- H4.* Green innovation can mediate the relationship between the management control system and firm performance
- H5.* Social media networking can mediate the relationship between the management control system and firm performance

3. Research method

This method uses in this research is the quantitative one. The research object used is medium-sized construction and medium-sized real estate entrepreneurs in Indonesia, especially on the island of Java. Java was chosen because there are at least more than 149 million people living in the region. Java Island is inhabited by more than 56% of the total population in Indonesia. The survey was conducted using a questionnaire via Google Forms and distributed via email or forums to associations of construction and real estate entrepreneurs in Central Java, West Java, Banten, and DKI. Jakarta, East Java and D I Yogyakarta. The study used a simple random sampling technique for sampling selection. It involved a questionnaire assessment

using a Likert scale ranging 1 to 5 (Likert, 1932). The study took place from February 2023 to June 2023, or lasting for four months. Data tabulation and rigorous data testing assumed an added month. Below are the measurement indicators for each variable used in this study.

- (1) *Management control system* (Belief system, Boundary systems, Diagnostic control systems, and Interactive control systems (Hermawan, Bachtiar, Wicaksono, & Sari, 2021).
- (2) *Firm performance* (The measurements include long-term profitability, Sales growth, Liquidity resources, and Investment capacity Customer loyalty (Latifah, Setiawan, Aryani, & Rahmawati, 2021).
- (3) *Green Innovation* (Use of environmentally friendly raw materials, Products that are easy to find, and Product can be recycled (Tang *et al.*, 2018).
- (4) *Social Media Networking* (Number of business relationships established, Communication with business partners via social media, Product development through social media, and Contribution to business decision making via social media (Latifah *et al.*, 2022).

The method used in this study involves structural equation models (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). It uses the statistical test tool Smart.PLS.3.0. The analysis of the research data includes measuring the outer model, evaluating the structural model (inner model), and testing the research hypothesis. In the Outer Model test, the Composite reliability data for indicator blocks that measure a construct is assessed by evaluating the composite reliability value. Dimensions are considered dependable if they have a composite reliability value above 0.7. The evaluation of the structural Inner Model involved using R-square. If the R-Square value is greater than 0.2, it can be interpreted that the latent predictor has an outsized influence at the structural level. The structural inner model is also evaluated by looking at the Q-Square predictive relevance. If the Q-Square value is greater than 0 (zero), it indicates that the model has predictive relevance. The model lacks predictive relevance if it less than 0 (zero).

4. Research method

Following the distribution of questionnaires, sample data of 203 respondents was obtained. These respondents were then divided into several regions, (Table 1).

The distribution of the questionnaires was challenging because it took time to find data on respondent profiles. As the results, the questionnaires were only distributed in 6 out of 38 provinces in Indonesia. It covered only 15.7% of the total provinces.

Based on Table 1, it is known that the number of respondents consist of 173 men and thirty women respondents. There are six male construction and real estate middle class entrepreneurs with vocational education and zero women. 56 male construction and real estate middle class entrepreneurs and five female entrepreneurs have a diploma educational background. In the construction and real estate industry, there are 98 middle-class entrepreneurs with bachelor's degree, of which 20 are women. Additionally, there are thirteen men and five women who are middle-class entrepreneurs, with a master's degree. This shows that business players in Indonesia, particularly in Java, have diverse educational backgrounds, ranging from vocational school to master's degree in the construction and real estate sector. The descriptive test results also found that respondents in the 1–30 years category had annual sales turnover ranging from Rp. 15 billion to more than Rp. 50 billion. On the other hand, respondents in the category of more than 30 years only had an average sales turnover per year ranging from IDR 15 billion to IDR 25 billion.

Region/area of respondent's business location	Total		Gender			Sales per year			
			Man	Woman	Long effort	IDR 15 billion – IDR 25 billion	IDR 26 billion – IDR 36 billion	IDR 37 billion – IDR 50 billion	More than IDR 50 billion
Central Java	48 people	Last education							
West Java, Banten, DKI Jakarta	88 people	Diploma	56	5	1–9 Years	71	21	1	1
East Java	50 people	Bachelor degree	98	20	10–19 Years	53	30	9	1
Special regions of Yogyakarta	17 people	Master degree	13	5	20–30 Years	8	5	0	2
		Senior High school	6	0	>30 Years	1	0	0	0
Total	203 people	Total	173	30	Total	133	56	10	4

Table 1. Respondent's descriptive

Source(s): Data results, 2023

These results (Table 2) were obtained by comparing the value of the r count with the r table. The provisions for this calculation were obtained using the degree of freedom (DF = N-2) or DF = 203-2 = 201, then the r table value of 201 is received at 0.138. When r count > r table, this value means that all statement items are valid and can be used in research. Based on Table 2 the reliability test results, it is known that the Cronbach's alpha value of all variables is greater than the standard provisions of the reliability test, namely 0.70. High or low reliability is expressed by the reliability coefficient, ranging from 0–1. The reliability coefficient is denoted as r_x by x, which is the case index looked for. Reliability testing uses Cronbach's Alpha formula, as follows.

$$r_x = \left(\frac{n}{n-1} \right) \left(1 - \frac{\sum \sigma_i^2}{\sigma_t^2} \right)$$

r_x = the reliability looked for

n = the number of question items

$\sum \sigma_i^2$ = the sum of the variances of the scores of each item

σ_t^2 = the total variance

4.1 The Cronbach's alpha value range, namely

- (1) alpha <0.50 low reliability
- (2) 0.50 < alpha <0.70 moderate reliability
- (3) alpha >0.70 sufficient reliability
- (4) alpha >0.80 then reliability is strong
- (5) alpha >0.90 then reliability is excellent

Variable	Item	Correlation (r)		Alpha	Coefficient Status
		r	Status		
Management control systems	MCS1	0.608	Valid	0.932	excellent dependable
	MCS2	0.900			
	MCS3	0.904			
	MCS4	0.889			
	MCS5	0.887			
	MCS6	0.637			
	MCS7	0.911			
	MCS8	0.909			
Green innovation	GI1	0.557	Valid	0.827	strong dependable
	GI2	0.613			
	GI3	0.711			
	GI4	0.661			
	GI5	0.610			
	GI6	0.638			
	GI7	0.685			
	GI8	0.714			
	GI9	0.642			
Social media networking	SM1	0.676	Valid	0.754	sufficient dependable
	SM2	0.797			
	SM3	0.790			
	SM4	0.768			
Firm performance	FP1	0.597	Valid	0.854	strong dependable
	FP2	0.779			
	FP3	0.754			
	FP4	0.660			
	FP5	0.737			
	FP6	0.730			
	FP7	0.759			
	FP8	0.743			
	FP9	0.545			
	FP10	0.250			

Table 2.
Test validity and reliability

Source(s): Research data tabulation, 2023

This result means that management control systems can explain the variability of the firm performance contract of 99.9% (Figure 1, Figure 2, and Table 3).

If the management control system is fulfilled or adequate, it can improve the performance of the executors (satisfactory performance). This finding supports the previous literature (Haseeb *et al.*, 2019; Muktiyanto, Hermawan, & Hadiwidjaja, 2020; Rodrigues *et al.*, 2021). Then, management control systems have a positive effect on social media networking. This means that social media is driving a new set of models for several types of businesses that challenge traditional business processes and operations. Companies with high levels of product differentiation may instead adopt a more structured management control system (Ukko, Hildén, Saunila, & Tikkamäki, 2017). Thus, social networks can be used to establish a close relationship with customers, and consider customers as the most crucial asset in the company (Galbraith, 2005). The results of this test (Figures 1–4 and Table 3) support previous findings (Lin *et al.*, 2019; Xie, Huo, & Zou, 2019).

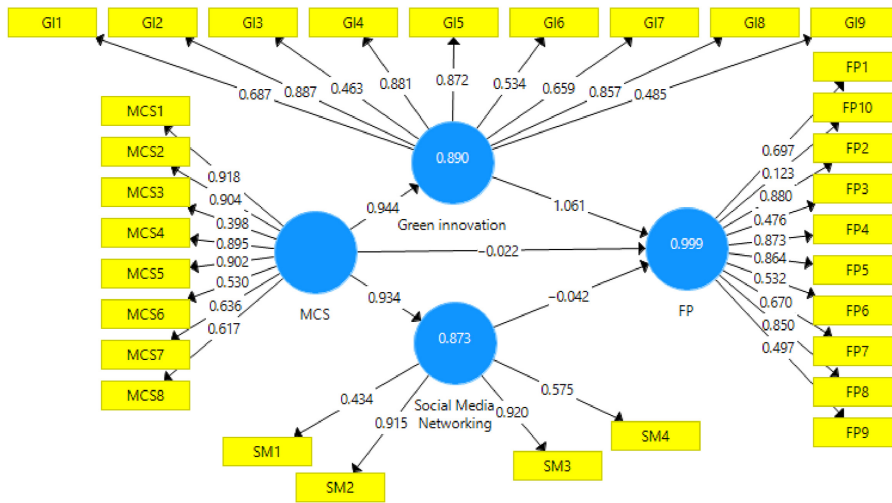


Figure 1.
Inner model test results
(*R*-square)

Source(s): Figure 1 courtesy of Smart.PLS.3.0

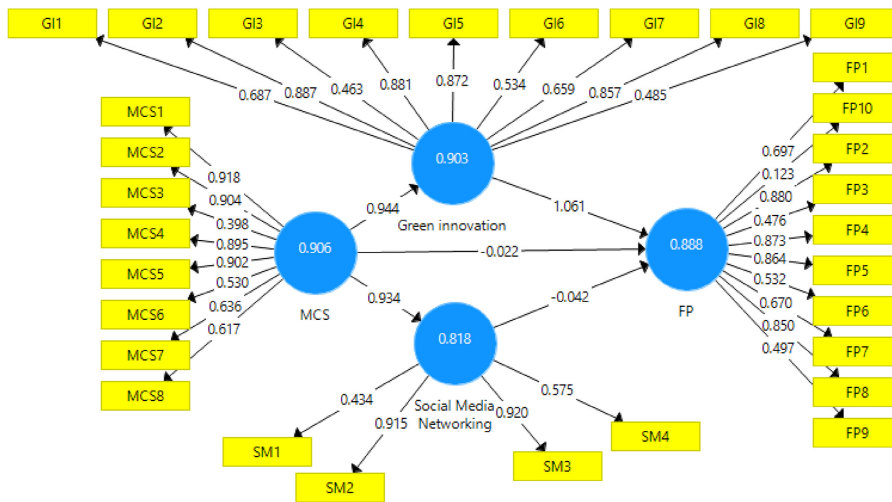


Figure 2.
Outer model test
results (composite
reliability)

Source(s): Figure 2 courtesy of Smart.PLS.3.0

5. Discussions

Have we ever wondered if, in ten years, the air you breathe will still be the same; or if it will be replaced by dense smoke that can choke your chest? Have we ever taken a moment to think if, in fifty years, the green trees will still be there; or if they will be replaced by dark concrete skyscrapers that steal the light of the sky? Have we ever thought that this nature, this earth, will no longer exist, or be the same? Not because of a futuristic film-style apocalypse; but because it has run out of energy, due to our own hands. This is a thought that everyone should realize, especially in Indonesia, which has now reached almost 260 million people. So, let us

Dimensions	Composite reliability	R-square
Managements control systems (X)	0.906	–
Green innovation (Z1)	0.818	0.873
Social media networking (Z2)	0.903	0.890
Firm performance (Y)	0.888	0.999

Hypothesis test result					t count	Koef. path		
H1	Management control systems	→	Firm performance		2,425	0.016	Sig	
H2	Management control systems	→	Green Innovation		97,172	0.000	Sig	
H3	Management control systems	→	Social media networks		63,762	0.000	Sig	
H4	Management control systems	→	Green Innovation	→	Firm performance	56,124	0.000	Sig
H5	Management control systems	→	Social media networks	→	Firm performance	2,887	0.004	Sig

Source(s): Test results, 2023

Table 3. Composite reliability calculation and hypothesis test results

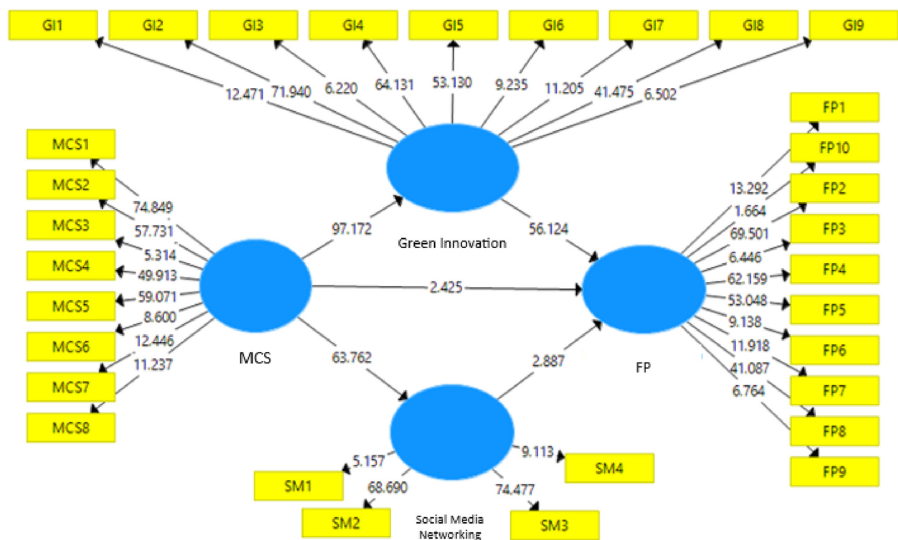


Figure 3. Hypothesis test results (t-count)

Source(s): Figure 3 courtesy of Smart.PLS.3.0

start implementing green innovation now. The time to act is now; the situation is urgent, and the future of our planet is at stake.

Green Innovation is a solution strategy that helps companies develop their business in the future. One example is the development of the Nusantara Capital (IKN) project, which will be built with the vision of a green city. Suppose that energy efficiency and conservation; must be achieved. In this case, it is essential to incorporate environmentally friendly, construction

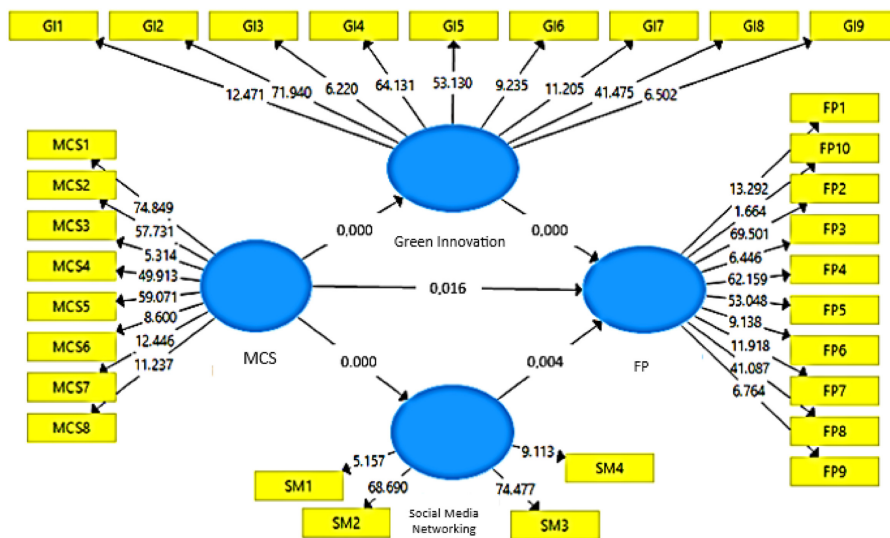


Figure 4. Hypothesis test results (*p*-value)

Source(s): Figure 4 courtesy of Smart.PLS.3.0

project and use circular water management and cooling management systems in the district area. Developing product through ecological processes that efficiently use of resources or energy; and minimize costs; will automatically improve company performance. Indonesia is the best real estate investment destination in the world. With the fourth largest population in the world; and a considerable demographic dividend, there will undoubtedly be a lot of demand for property in Indonesia, especially with the concept of green innovation or smart and green cities, which will occur in the coming years.

Communication technology plays a crucial role in current social changes. The Internet and new media, the most influential developments in communication technology today, are not just tools but platforms for people's voice and actions. The impact of the Internet, especially social media, has been proven to cause an industrial revolution. In Indonesia, social networking media is used in all areas, such as marketing, politics, and communication in the learning system, with active participation from society. The presence of social media also makes communication more effective. The strategic role of communication in today's companies, particularly in the context of digitalization and information disclosure, cannot be overstated. The advent of social media has further amplified its effectiveness. This heightened importance of communication has led to increased management focus on this aspects of the company. It is particularly crucial in the context of business transformation programs that drive innovations to advance Indonesia, compete in the global market, and support the green innovation industry in the future.

Indonesia still needs innovation in all industry sectors, especially real estate, and construction to manage the green environment. Therefore, all industry players must strive actively and wisely to use environmentally friendly resources and technology, to create effectiveness and efficiency for the sustainability of their business. As previously said, management control aims to encourage individuals to be creative and innovative. However, the concept flexibility of the Management Control System has evolved from solely controlling individuals to a broader concept; approach that support strategy and foster innovation (Agustia, 2020; Mignon & Bankel, 2022).

The real estate and construction business needs to know how to implement the right management control system so that green innovations can run smoothly. Therefore, a concept appeared to ease these activities, namely innovation management. Innovation management is the process companies use to identify, evaluate, and implement innovative ideas and innovative concepts. It includes planning, organizing, directing, and controlling the resources needed to achieve the formation of products, processes, or businesses in the innovation process. The purpose of innovation management is to improve the company's performance and increase the company's competitiveness. Innovation management can help companies stay relevant and competitive in a changing market. By implementing new innovations well, companies can improve their performance and competitiveness. However, it is essential to keep in mind that innovation is not a process that can be completed; it is an ongoing effort that must be continuously conducted.

6. Conclusion

Social media networks, green innovation, and company performance in the construction and real estate medium-sized businesses on Java Island have experienced a significantly positive impact from the management control system. This finding is based on the results of data testing. Furthermore, it was found that social media networks and green innovation strongly mediate the relationship between the management control system variable and the performance of upper-middle-class construction and real estate companies on Java Island.

This finding contributes theoretically to the idea that the proper implementation of management control systems in implementing green innovations and the proper use of social media can affect company performance. In order to implement this management control system, the government needs to offer guidance and education to real estate and construction entrepreneurs in Indonesia about the selection of environmentally friendly building materials. This guidance should be accessible to all levels of society, planners, and implementers, and should emphasize the responsible use of natural resources. The findings also contribute to the Indonesian government's policies regarding procedures, and rules, and standards for building projects that align green innovation. In addition, the government and practicing technologists must urgently prepare suitable and affordable technology for all levels of society. This is crucial to ensure that people are willing to use green innovation technology.

The limitations of this research is that the acquisition of survey data was quite long and challenging, because many contractors and real estate entrepreneurs have hectic schedules. The data collection and measurement techniques in this study also caused bias. This occurs in almost all qualitative and quantitative research methodologies. Instrument bias is one of the most common forms of bias in quantitative inquiry. A defective scale will result in instrument bias and invalidate the quantitative experimentation process. This data collection bias occurs when questionnaires in surveys are inappropriate or unstructured. It can also occur due to poorly worded statements or questions on the survey sheet, leading respondents to prejudge. In the subject selection and allocation phase, prior to data collection, approaches such as fixation for experimental studies, restriction, and matching for cohort designs can be applied. Next, in the data analysis phase, adjustments for confounders can be made through the approach of multivariate analysis.

The study should have included a more detailed explanation of the strategic indicators used to assess the implementation of green innovation in buildings in Indonesia. It briefly mentions that innovation management is a new area of study that real estate and construction entrepreneurs; need to learn to implement green innovation with an appropriate management control system. These gaps could be addressed through further research that

qualitatively explains the different strategic indicators for assessing green innovation, which are essential for middle-class entrepreneurs in the construction and real estate industries. Addressing these gaps will help ensure that the buildings they work on do not contribute to global warming in the future.

References

- Agustia, D. (2020). Innovation, environmental management accounting, future performance: Evidence in Indonesia. *Journal of Security and Sustainability Issues*, 9(3), 1005–1015. doi: [10.9770/jssi.2020.9.3\(24\)](https://doi.org/10.9770/jssi.2020.9.3(24)).
- Al-Shetwi, A. Q. (2022). Sustainable development of renewable energy integrated power sector: Trends, environmental impacts, and recent challenges. *Science of the Total Environment*, 822, 153645. doi: [10.1016/j.scitotenv.2022.153645](https://doi.org/10.1016/j.scitotenv.2022.153645).
- Brandl, J., & Zielinska, I. (2020). Reviewing the smart city Vienna framework strategy's potential as an eco-social policy in the context of quality of work and socio-ecological transformation. *Sustainability*, 12(3), 1–17. doi: [10.3390/su12030859](https://doi.org/10.3390/su12030859).
- Corral de Zubielqui, G., Lindsay, N., Lindsay, W., & Jones, J. (2019). Knowledge quality, innovation and firm performance: A study of knowledge transfer in SMEs. *Small Business Economics*, 53(1), 145–164. doi: [10.1007/s11187-018-0046-0](https://doi.org/10.1007/s11187-018-0046-0).
- Cosenz, F., & Noto, L. (2015). Combining system dynamics modelling and management control systems to support strategic learning processes in SMEs: A dynamic performance management approach. *Journal of Management Control*, 26(2-3), 225–248. doi: [10.1007/s00187-015-0208-z](https://doi.org/10.1007/s00187-015-0208-z).
- Dai, D., & Xue, Y. (2022). The impact of green innovation on a firm's value from the perspective of enterprise life cycles. *Sustainability*, 14(3), 1226. doi: [10.3390/su14031226](https://doi.org/10.3390/su14031226).
- Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., . . . Wang, Y. (2021). Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management*, 59(June 2020), 102168. doi: [10.1016/j.ijinfomgt.2020.102168](https://doi.org/10.1016/j.ijinfomgt.2020.102168).
- Ejiogu, A. R., & Jain, N. (2012). Contingency theory and management control packages in small firms: Case evidence from India. *International Journal of Management, Entrepreneurship and Technology*, 2, 1–11.
- Epstein, M. J. (2018). Performance measurement and management control: Challenges for applications and research in new settings. *Studies in Managerial and Financial Accounting*, 33, 3–12. doi: [10.1108/S1479-351220180000033001](https://doi.org/10.1108/S1479-351220180000033001).
- Farida, I. & Setiawan, D. (2022). Business strategies and competitive advantage: The role of performance and innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(163), 1–16.
- Femenia-Serra, F., Gretzel, U., & Alzua-Sorzabal, A. (2022). Instagram travel influencers in #quarantine: Communicative practices and roles during COVID-19. *Tourism Management*, 89(November 2021), 104454. doi: [10.1016/j.tourman.2021.104454](https://doi.org/10.1016/j.tourman.2021.104454)
- Galbraith, J. R. (2005). *Designing the customer-centric organization*. San Francisco: Jossey-Bass.
- Hair, J., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial LeastSquares structural equation modeling (Pls-Sem) an emerging tool in business research. *European Business Review*, 26(2), 106–121. doi: [10.1108/ebur-10-2013-0128](https://doi.org/10.1108/ebur-10-2013-0128).
- Hana, P., Sha, S., & Bohlin, E. (2021). Exploring the consequence of social media usage on firm performance. *I(2)*, 100013. doi: [10.1016/j.digbus.2021.100013](https://doi.org/10.1016/j.digbus.2021.100013).
- Harris, E., Herzig, C., De Loo, I., & Manochin, M. (2019). Management accounting and control for sustainability and strategic decision making. *Journal of Management Control*, 30(1), 1–4. doi: [10.1007/s00187-019-00278-9](https://doi.org/10.1007/s00187-019-00278-9).

-
- Haseeb, M., Lis, M., Haouas, I., & Mihardjo, L. W. W. (2019). The mediating role of business strategies between management control systems package and firms stability: Evidence from SMEs in Malaysia. *Sustainability*, *11*(17), 4705. doi: [10.3390/su11174705](https://doi.org/10.3390/su11174705).
- Hermawan, A. A., Bachtiar, E., Wicaksono, P. T., & Sari, N. P. (2021). Levers of control and managerial performance: The importance of belief systems. *Gadjah Mada International Journal of Business*, *23*(3), 237–261. doi: [10.22146/gamaijb.62612](https://doi.org/10.22146/gamaijb.62612).
- Huang, J. W., & Li, Y. H. (2018). How resource alignment moderates the relationship between environmental innovation strategy and green innovation performance. *Journal of Business and Industrial Marketing*, *33*(3), 316–324. doi: [10.1108/JBIM-10-2016-0253](https://doi.org/10.1108/JBIM-10-2016-0253).
- Iqbal, M., & Suzianti, A. (2021). New product development process design for small and medium enterprises: A systematic literature review from the perspective of open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(2), 153. doi: [10.3390/joitmc7020153](https://doi.org/10.3390/joitmc7020153).
- Khan, S. A. R., Ponce, P., Tanveer, M., Aguirre-Padilla, N., Mahmood, H., & Shah, S. A. A. (2021). Technological innovation and circular economy practices: Business strategies to mitigate the effects of COVID-19. *Sustainability*, *13*(15), 1–17. doi: [10.3390/su13158479](https://doi.org/10.3390/su13158479).
- Khan, S. J., Kaur, P., Jabeen, F., & Dhir, A. (2021). Green process innovation: Where we are and where we are going. *Business Strategy and the Environment*, *30*(7), 3273–3296. doi: [10.1002/bse.2802](https://doi.org/10.1002/bse.2802).
- Latifah, L., Setiawan, D., Aryani, Y. A., & Rahmawati, R. (2021). Business strategy – MSMEs’ performance relationship: Innovation and accounting information system as mediators. *Journal of Small Business and Enterprise Development*, *28*(1), 1–21. doi: [10.1108/JSBED-04-2019-0116](https://doi.org/10.1108/JSBED-04-2019-0116).
- Latifah, L., Setiawan, D., Aryani, Y. A., Sadalia, I., & Al Arif, M. N. R. (2022). Human capital and open innovation: Do social media networking and knowledge sharing matter?. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(3), 116. doi: [10.3390/joitmc8030116](https://doi.org/10.3390/joitmc8030116).
- Likert, R. (1932). Technique for the measurement of attitudes. *Archives of Psychology*, *140*, 1–55.
- Lin, W. L., Cheah, J., Azali, M., Ho, J. A., & Yip, N. (2019). Does firm size matter? Evidence on the impact of the green innovation strategy on corporate financial performance in the automotive sector. *Journal of Cleaner Production*, *229*, 974–988. doi: [10.1016/j.jclepro.2019.04.214](https://doi.org/10.1016/j.jclepro.2019.04.214).
- Ma, L., Hong, Y., Chen, X., & Quan, X. (2022). Can green innovation and new urbanization Be synergistic development? Empirical evidence from Yangtze river delta city group in China. *Sustainability*, *14*(10), 5765. doi: [10.3390/su14105765](https://doi.org/10.3390/su14105765).
- Malesev, S., & Cherry, M. (2021). Digital and social media marketing-growing market share for construction smes. *Construction Economics and Building*, *21*(1), 65–82. doi: [10.5130/AJCEB.v21i1.7521](https://doi.org/10.5130/AJCEB.v21i1.7521).
- Meng, Q., Zhu, H., Li, Z., Du, J., Wang, X., & Kim, M. J. (2018). How green building product decisions from customers can be transitioned to manufacturers: An agent-based model. *Sustainability*, *10*(11), 3977. doi: [10.3390/su10113977](https://doi.org/10.3390/su10113977).
- Mignon, I., & Bankel, A. (2022). Sustainable business models and innovation strategies to realize them: A review of 87 empirical cases. *Business Strategy and the Environment*, *32*(May), 1–16. doi: [10.1002/bse.3192](https://doi.org/10.1002/bse.3192).
- Miller, N., Pogue, D., Gough, Q., & Davis, S. (2020). Green buildings and productivity. *Journal of Sustainable Real Estate*, *1*(1), 65–89. doi: [10.1080/10835547.2009.12091783](https://doi.org/10.1080/10835547.2009.12091783).
- Mishra, D. R. (2017). Post-innovation CSR performance and firm value. *Journal of Business Ethics*, *140*(2), 285–306. doi: [10.1007/s10551-015-2676-3](https://doi.org/10.1007/s10551-015-2676-3).
- Muktiyanto, A., Hermawan, A. A., & Hadiwidjaja, R. D. (2020). The role of management control systems in the performance of higher education through good university governance. *International Journal of Trade and Global Markets*, *13*(3), 288–310. doi: [10.1504/IJTGM.2020.108777](https://doi.org/10.1504/IJTGM.2020.108777).
- Pratono, A. H. (2017). From social network to firm performance the mediating effect of trust, selling capability. doi: [10.1108/MRR-03-2017-0080](https://doi.org/10.1108/MRR-03-2017-0080).

- Regona, M., Yigitcanlar, T., Xia, B., & Li, R. Y. M. (2022). Artificial intelligent technologies for the construction industry: How are they perceived and utilized in Australia?. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(1), 16. doi: [10.3390/joitmc8010016](https://doi.org/10.3390/joitmc8010016).
- Rehman, S. U., Bhatti, A., Kraus, S., & Ferreira, J. J. M. (2020). The role of environmental management control systems for ecological sustainability and sustainable performance. *Management Decision*, 59(9), 2217–2237. doi: [10.1108/MD-06-2020-0800](https://doi.org/10.1108/MD-06-2020-0800).
- Rodrigues, M., Alves, M. D. C., Oliveira, C., Vale, J., & Silva, R. (2021). The impact of strategy, environment, and the management system on the foreign subsidiary: The implication for open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1), 1–23. doi: [10.3390/joitmc7010051](https://doi.org/10.3390/joitmc7010051).
- Ruiter, H., De Feijter, F., & Wagenveld, K. (2022). Management control and business model innovation in the context of a circular economy in the Dutch construction industry. *Sustainability*, 14(1), 366. doi: [10.3390/su14010366](https://doi.org/10.3390/su14010366).
- Ruiz-Real, J. L., Uribe-Toril, J., Torres, J. A., & Pablo, J. D. E. (2021). Artificial intelligence in business and economics research: Trends and future. *Journal of Business Economics and Management*, 22(1), 98–117. doi: [10.3846/jbem.2020.13641](https://doi.org/10.3846/jbem.2020.13641).
- Sezen, B., & Çankaya, S. Y. (2013). Effects of green manufacturing and eco-innovation on sustainability performance. *Procedia - Social and Behavioral Sciences*, 99, 154–163. doi: [10.1016/j.sbspro.2013.10.481](https://doi.org/10.1016/j.sbspro.2013.10.481).
- Szumilo, N., & Fuerst, F. (2020). The operating expense puzzle of US green office buildings. *Journal of Sustainable Real Estate*, 5(1), 86–110. doi: [10.1080/10835547.2014.12091847](https://doi.org/10.1080/10835547.2014.12091847).
- Tang, M., Walsh, G., Lerner, D., Fitz, M. A., & Li, Q. (2018). Green innovation, managerial concern and firm performance: An empirical study. *Business Strategy and the Environment*, 27(1), 39–51. doi: [10.1002/bse.1981](https://doi.org/10.1002/bse.1981).
- Ukko, J., Hildén, S., Saunila, M., & Tikkamäki, K. (2017). Comprehensive performance measurement and management—innovativeness and performance through reflective practice. *Journal of Accounting and Organizational Change*, 13(3), 425–448. doi: [10.1108/JAOC-09-2015-0070](https://doi.org/10.1108/JAOC-09-2015-0070).
- Vale, J., Barbosa, N., Bertuzi, R., Bandeira, A. M., & Vale, V. T. (2021). Intellectual capital change management in the construction industry—the case of an inter-organisational collaboration. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(3), 199. doi: [10.3390/joitmc7030199](https://doi.org/10.3390/joitmc7030199).
- Voland, N., Saad, M. M., & Eicker, U. (2022). Public policy and incentives for socially responsible new business models in market-driven real estate to build green projects. *Sustainability*, 14(12), 7071. doi: [10.3390/su14127071](https://doi.org/10.3390/su14127071).
- Wijaya, T., Darmawati, A., & Kuncoro, A. M. (2020). E-lifestyle confirmatory of consumer generation Z. *International Journal of Advanced Computer Science and Applications*, 11(10), 27–33. doi: [10.14569/IJACSA.2020.0111004](https://doi.org/10.14569/IJACSA.2020.0111004).
- Wirtz, D., Tucker, A., Briggs, C., & Schoemann, A. M. (2021). How and why social media affect subjective well-being: Multi-site use and social comparison as predictors of change across time. *Journal of Happiness Studies*, 22(4), 1673–1691. doi: [10.1007/s10902-020-00291-z](https://doi.org/10.1007/s10902-020-00291-z).
- Wong, C. W. Y., Wong, C. Y., Boon-Itt, S., & Tang, A. K. Y. (2021). Strategies for building environmental transparency and accountability. *Sustainability*, 13(16), 9116. doi: [10.3390/su13169116](https://doi.org/10.3390/su13169116).
- Xie, X., Huo, J., & Zou, H. (2019). Green process innovation, green product innovation, and corporate financial performance: A content analysis method ☆. *Journal of Business Research*, 101(January), 1–10. doi: [10.1016/j.jbusres.2019.01.010](https://doi.org/10.1016/j.jbusres.2019.01.010).
- Xie, Z., Wang, J., & Zhao, G. (2022). Impact of green innovation on firm value: Evidence from listed companies in China's heavy pollution industries. *Frontiers in Energy Research*, 9(January), 1–17. doi: [10.3389/fenrg.2021.806926](https://doi.org/10.3389/fenrg.2021.806926).

- Zeadat, Z. F. (2022). Urban green infrastructure in Jordan: A perceptive of hurdles and challenges. *Journal of Sustainable Real Estate*, 14(1), 21–41. doi: [10.1080/19498276.2022.2098589](https://doi.org/10.1080/19498276.2022.2098589).
- Zhang, J., Liang, G., Feng, T., Yuan, C., & Jiang, W. (2020). Green innovation to respond to environmental regulation: How external knowledge adoption and green absorptive capacity matter?. *Business Strategy and the Environment*, 29(1), 39–53. doi: [10.1002/bse.2349](https://doi.org/10.1002/bse.2349).

Corresponding author

Ida Farida can be contacted at: ida.farida@poltektegal.ac.id

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgroupublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com