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Cleaner operations in hotels: Recommendation for post-pandemic green recovery

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ABSTRACT

Although the extant studies had examined the impact of green marketing, limited research has focused on green marketing as an attempt of cleaner production. This paper contributes to green marketing and cleaner production literature by introducing "clean service marketing" through adaptation of cleaner production onto the expanded green service marketing mix (people, physical evidence and process). The study further contributes to the literature by investigating the possible influence of clean service marketing in providing health value, enhancing social-quality performance and good differentiation advantage. The authors adopted a mixed-method study by systematic review and survey questionnaire to collect data. A systematic review was conducted to address the research question "Do firms' green approaches provide health value to its stakeholder? While 101 sets of questionnaire were distributed to the managers of the selected three-to-five stars hotel and resort in Malaysia to confirm the proposed hypotheses. Partial Least Square-Structural Equation Modeling was employed for quantitative data analysis, and SmartPLS 3.2.8 software was performed to analyze the data obtained. The results of the synthesis analysis addressed the research question that firms or any practitioners by going green could either improved human's health or perceived health. The result of the quantitative analysis revealed that only the green process is positively related to social-quality performance. In contrast, green people, green physical evidence and green process were found all positively related to differentiation advantage. With regards, the authors strongly recommend hotel and resort firms taking green as a "clean" approach for hotels' post-pandemic recovery.

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1. Introduction

The year 2020 will see a decline in global greenhouse gas emissions with a massive reduction of global warming drivers such as high flying-aircraft (Corlett et al., 2020). It is not that peoples had shifted their behaviour to be more environmentally friendly, but the spread of COVID 19 pandemic had restricted people and industrial's movements as forcefully. In the condition that life is vulnerable that can be easily triggered by cough and flu, a clean environment that found to have a significant impact to minimize the spread of pandemic has been put in the spotlight. Such trend of

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https://doi.org/10.1016/j.jclepro.2020.124621 0959-6526/© 2020 Elsevier Ltd. All rights reserved. keeping people clean and safe had found support from the government and therefore followers in the hotel industry albeit the current practice to carry on with what is familiar in the business (Malaysia Association of Hotels, 2020). Consequently, it is crucial to ensure the right approaches to be shared among the market players to drive recovery in all aspect after the pandemic.

Given the unexpected catalyst of pandemics to a better environment and the mechanism of "going clean" as an environmentally friendly approach (De Oliveira Santos et al., 2020; Glavic and Lukman, 2007), equipping and fulfilling the health safety and hygiene requirements in hotels might fit the green concept addressing the current pandemic wrath to be a new approach of green marketing. It further indicates that the new process of green marketing should follow the current trend going beyond the environmental value to associate with the benefit to human's health (Xu et al., 2020; Alhosseini, Tabataba'i-Nasab and Bagheri Garabollagh

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et al., 2019; Wen and Li, 2013). Hence, the authors suggested applying cleaner production to the existing green marketing as a way forward for post-pandemic recovery. None of the previous research had such focus despite the widespread recognition of green marketing, and even when green reinforcement as implications for cleaner production is evident (Zameer et al., 2020).

On the same note, the current focus of post-pandemic recovery is aligned with the suggestion of Di Marco et al. (2020) that pandemic risk should be considered for environmentally sustainable development. The authors agreed upon the key reason caused tourism market vulnerability that the business is susceptibility to the "people-first" in nature (UNWTO, 2020). It was reported that the practice of social distancing and isolation that is essential to be implemented during the pandemic had indeed weakened the wellbeing of a specific group of peoples and lead to long term consequences (Veira, Franco and Restrepo et al., 2020). In the worst-case scenario, a person's stress level could lift to a greater extent towards anxiety during the pandemic (Roy et al., 2020). Far more severe, the heightened stress level may not be diminished with the recovery of a crisis (Veira et al., 2020). The persistence psychological distress of the communities will become eventually detrimental to a tourism recovery. With regards, the authors suggested examining the green adaptation as a clean approach to be one of the health measures criteria for hotel's post-pandemic recovery.

Apart from that, the authors also identified the need to investigate social value that clean service marketing could provide. This attempt is significant as the pandemic had put global travel businesses in a very challenging position. It is among the sector that affected the most as the tourism suspension brings direct impact to the other related industries like aviation, hospitality and small and medium businesses causing millions of jobs and myriad of people at risk (UNWTO, 2020). Thus a firm's social-quality performance that weight the travellers and employees value with the potential to lead to a higher level of business performance (Tari et al., 2017), has been seen as one of the critical measures for post-pandemic business recovery. To the knowledge of the authors, this is the first social science study that had put organizational social dimension for post-pandemic recovery into play, and it is also among the pioneer study that recommending clean service marketing to enhance firms' social quality performance.

In Malaysia, there are more than 20 million tourist arrivals each year since 2007 to 2019, and the sector as a whole had generated more than USD 200 billions of gross domestic product since then (Tourism Malaysia, 2020). The future growth of the industry had urged Malaysia government to welcome a total of 30 million tourists in 2020 as one of the nation's vision with the target of USD 25 billion generated in that year (MOTAC, 2019). However, the pandemic had positioned Malaysia Tourism in a dilemma. The country recorded more than USD 800 millions of losses in January itself, hitting hoteliers hardly with the cancellation of flights and trips (MOTAC, 2020). To help combat this pandemic, the Ministry of Finance Malaysia (2020) has provided an economic stimulus package amounting to RM250 billion. However, this alone will not be able to help the hoteliers because this industry needs people to travel and stay at hotels which are not permissible during the pandemic and might still be unfavourable after the pandemic.

Moreover, the future growth of the tourism industry following the nation's tourism vision had drawn an increasing number of hotel and room supplies in Malaysia before the pandemic (Tourism Malaysia, 2020). Other than its bright side of industry growth, it mirrors an intense competition among the industry player. The situation is getting worse when Airbnb entered the market with 137% of growth in a year, taken away a significant part of the market share (Tiamiyu et al., 2020). The competitiveness of an individual

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hotel and resort is alarming, and the business is more vulnerable after the pandemic strikes. Thus, how a hotel differentiates itself with the others as a "clean" hotel would be the critical competitive advantage for post-pandemic recovery. It is expected that "clean" practice will create a certain level of assurance on the travellers' health and therefore lure people to travel again. For this reason, the authors suggested clean service marketing to address issues on the pandemic for differentiation advantage.

The seven Ps marketing mix was introduced in the early 1980s as the new marketing mix that stresses service to help formulate marketing strategy (Collier, 1991). With regards to the "people-first" nature of the hotel industry, the service components of the marketing mix (people, physical evidence and process) that is claimed to be more people-oriented were highlighted (Booms and Bitner, 1981). Given the importance of health measures for the tourism recovery and in line with the objective of UNWTO and World Health Organization (WHO) that priorities people and their wellbeing (Word Tourism Organization UNWTO, 2020), it is of interest to know whether hotel by cleaning their service marketing through an attempt to adopt green will reflect its value on human's health. To this aim, its outcome towards social-quality and differentiation advantage will be further investigated. Therefore, below research questions are addressed for consideration:

Question 1: Do firms' green approaches provide health value to its stakeholder?

- Question 2: Does the hotel's green service marketing lead to social-quality performance?
- Question 3: Does the hotel's green service marketing lead to a differentiation advantage?

The literature review, conceptual framework, methodology, key findings and discussions are presented in the preceding sections.

2. Literature review

2.1. Greening the expanded marketing mix for services as part of cleaner production

Cleanliness when facing the pandemic to date implores that clean issues have been taken into consideration seriously based on the knowledge of how viruses may be transferred. Cleaner production is described as an approach an organization runs its production activities in a way that is clean to be able to reduce negative impacts on the environment (Glavic and Lukman, 2007). It involves all hierarchical levels of an organization and makes no restriction to any business activities; and takes preventive measures to ensure the environmental efficiency of the cleaner production at all activities (De Oliveira Santos et al., 2020). Therefore, it is relevant to the services firm despite the physical product is absent in the service production (De Oliveira Santos et al., 2020). The mainstream studies reached a consensus that cleaner production brings the least environmental impact mainly by minimizing the usage of resources, reducing Carbon Dioxide emission, optimizing the usage of natural resources, and most importantly, ensuring better health and safety of the internal and external stakeholder (De Oliveira Santos et al., 2020; Glavic and Lukman, 2007; Unnikrishnan and Hegde, 2006).

Previous research provided a significant insight that most of the services firms are not aware of the waste they generated as they are not involved in the physical products' production (De Oliveira Santos et al., 2020). In fact, cleaner production can be adopted in the service delivery process, and green marketing can be implemented as one of the strategies to foster green product development (Dangelico and Vocalelli, 2017). The study of De Oliveira

Santos et al. (2020) explored the barriers of service's cleaner production in three major areas, and these areas were found to fit into the expanded marketing mix elements for services. First, in the services that massive labour forces are required, the lack of training for servicing employees to practice cleaner production was found as the leading barrier (De Oliveira Santos et al., 2020). Employees, especially those who are well trained are the essential human capital that works together to generate new ideas, manage conflicts, resolve problems and encourage learning in an organization's green process (Jabbour, 2013). Furthermore, customer's attitude, trust and satisfaction on green service and product are uncertain and subjective (Martinez, Cremasco, Gabriel Filho et al., 2020). Consumers can easily lose their trust on a green service when it can't perform as promised; therefore, retraining of employees can be seen as a focus for a new level of cleanliness in a hotel to serve green travellers.

Second, in the service factory that a physical venue for customer service is highlighted (Chase and Erikson, 1988); and third, in the professional service where professionalism is required, the customer involvement and their co-production in cleaner service delivery process was found as the major barrier (De Oliveira Santos et al., 2020). When the tangible component of the services cannot be measured in the physical service production place, the physical surroundings and its other related cues have a profound effect on the service quality (Lovelock et al., 2015). These cues include the physical layout, ambience, and comfort, which have a significant impact on a customer's impression and satisfaction (Lovelock et al., 2015). On the other hand, customer perception was found to have a certain level of dominance over a professional service based on the service delivered (Bojanic, 2008; Parasuraman et al. 1985). Service itself is a system that operates with processes (Pomering and Johnson, 2018). An unsolved question is whether the consumer would favour the greener service process? Would it be then making service cleaner production a successful approach?

The initial idea of Boom and Bitner's (1981) people elements in the marketing mix offers a mechanism between production and consumption. It was referred to as the human factors involving in the service delivery (Hoffman and Bateson, 2010) that foster direct interaction between the customer and service provider (Lovelock et al., 2015). Prior researches on the environmental topic regarded both employees and customers in the overall service delivery environment as the green people of an organization (Pomering and Jonhson, 2018; Rafiq and Ahmed, 1995). In the context of the hotel industry, except the green responsibilities endued, the hotel's green environment was found as the factor arising employees' intention to practice green (Okumus et al., 2019). When an employee is aware, concern and possesses knowledge on the environment, the hotel's green environment will strengthen its intention to practice green (Okumus et al., 2019). In contrast, green hotel customers seek to enjoy the environmental promise of a hotel, and they are willing to pay for green service facilities and deliveries (Kim and Han, 2010). It is expected that there will be a new wave of green people after the pandemic where the green employee will work on providing clean and virus-free services; while the green customers will enjoy this clean services.

The second expanded element - Physical evidence in green marketing is framed in a system of green content that involved all parts of the system (Kumar and Rohtak, 2014). This is in the same vein with the previous studies that the coverage of green physical evidence should cover the whole system from the operations, production to the product sold instead of a particular selected area (Eneizan et al., 2016) or should at least include the spaces that are open for human interaction (Sreenivas et al., 2013; Swanwick et al., 2003). In the context of hotels, green physical evidence promotes the tangible component of a hotel environment to facilitate green

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service transaction among the hotel guests and form profound perception (Salman et al., 2017). The physical surrounding covers the whole service system from the environmental friendly exterior structure of the facility, exterior landscaping, common areas, bedrooms, employees and so on. New physical evidence after the pandemic may also include safety and hygiene standard such as proper social distancing that avoid the cloud, availability of hand sanitizers, biodegradable disposable shoes cover and gloves at main hotel areas to improve the confidence level of the travellers (Malaysia Association of Hotels, 2020). Greening the physical evidence is essential because customer satisfaction is ensured while the positive emotional value is created through green tangible and intangible physical evidence (Lovelock et al., 2015).

The third expanded elements - service process is categorized mainly based on its tangibility as well as its direct recipient. According to Lovelock et al. (2015), there are four types of service processes, namely the people-processing, possession-processing, mental-stimulus processing and information-processing process. In terms of the hotel's service processing, hotel's services that require the presence of hotel guest in the service factory is considered as people-processing. However, there is also a particular portion of the possession processing element in its service process when the hotel guests store their possession in the service facilities boundary. The integration of green into a process such as green service brand, green certification, green labelling and green service life-cycle (Solvalier, 2010) would work well in building a firm's green identity which effectively reflects a certain extent of a hotel's cleanliness. All the processes mentioned by previous researchers were looking at the securing repeat patronage and lovalty through the satisfaction of services received by the customers. However, hoteliers will also need to look above and beyond what they are accustomed to the green concept and focus on addressing social-quality performance, and differentiation advantage delivers by the establishment.

The following section touches the significant linkage between expanded green service marketing mix and social quality performance.

2.2. Greening the expanded marketing mix for social-quality performance

As mentioned earlier, there is a scarce of research highlighted social-quality performance, and none of the previous evidence had shown linkage between green marketing as part of the cleaner production and firm's social-quality performance. Rather than specific attention to green marketing, previous research related social quality with social relations (Beck et al., 2001) in terms of participation (Beck et al., 1997) and measured it through social inclusion (Berman and Philips, 2000), socio-economic security, social cohesion and empowerment (Putnam, 2001) despite green marketing is well-known as part of the social marketing (Kotler and Zaltman, 1971). Looking into the current research interest that emphasizes the "people" factor, the authors attempt to link the impact of clean service marketing on the quality of social welfare. The customer and employee satisfaction were taken into consideration concerning the significant weight-age of people element on social welfare as to permit a higher level of business efficiency and performance (Tari et al., 2017) after the pandemic. It is expected that overall hotel performance will be improved through customer focus and employee fulfilment as part of the quality management (Muslim et al., 2017). However, a more thorough study is required to explore the influence of clean service marketing on these aspects. With regards, the following hypotheses are drawn:

H1. Green people are positively related to social-quality performance

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H2. Green physical evidence is positively related to social-quality performance

H3. Green process is positively related to social-quality performance

2.3. Greening the expanded marketing mix for differentiation advantage

The direct effect between the expanded green marketing mix elements and differentiation advantage was evident (Samarasinghe and Ahsan, 2013; Ehmke, 2008). To pursue differentiation advantage for hotel services, hotel firms are advised to fulfil at least two requirements. Firstly, the "people" of the hotel firm need to be educated in practising green. Secondly, a hotel firm should establish its green credibility to satisfy its customer needs and desire to ensure they are standing out from the crowd (Martinez et al., 2020). Moreover, physical evidence of a firm is playing a significant role to spur green action that would nurture employees' green behaviour, and this motivation was found significantly led to a firm's differentiation advantage (Tiong et al., 2017). However, it has been an argument that physical setting is not applicable in creating an impression or stronger feeling for consumer's peace of mind (Lovelock et al., 2015). Hence, it brought to the authors' attention to re-examine the influence of firms' green physical evidence and green people on differentiation advantage.

Furthermore, adopting green into the process was found to be another key to differentiation advantage (Samarasinghe and Ahsan, 2013). There is a tendency for firms without accommodating green into the operation process to be withdrawn from the consumer's selection list (Carroll and Buchholtz, 2015). Without an environmentally friendly process, firms are perceived as just similar to the other service provider. Therefore, green people, green physical evidence and green process that made up clean service marketing are expected to differentiate a hotel firm through "clean" elements addressed that would enlarge the hotel's initiative to protect their stakeholder. Thus, positive relationships are hypothesized:

H4. Green people are positively related to differentiation advantage

H5. Green physical evidence is positively related to differentiation advantage

H6. Green process is positively related to differentiation advantage

2.4. Conceptual framework

In a recent study by Dangelico and Vocalelli (2017), the Green Marketing concept shows an evolution of the idea over time, moving away from being a tool of traditional marketing to becoming a strategy affecting the whole company; either from focusing on specific environmental problems to taking into account global sustainability issues; or from regarding specific products and industries to pervade the whole market. There was a significant insight provided by Moroles, Ture and Tudoe (2020) that green marketing lost its meaning to no impact for a business's sustainability if the execution merely depends on one marketing effort or if there is no clear strategy on the implementation. Their idea is almost in the same vein as Dangelico et al. (2017) given that the study of Dangelico et al. (2017) with different research focus also found the insufficiency of green marketing alone in maximizing social welfare. Although sustainability and social welfare are not the main focus of this study, it warrants attention when the authors investigate the dual role of green service marketing as a cleaner production and marketing strategy at the same time. The authors highlighted the impact of cleaner production as a complementary effort to green service marketing for pandemic recovery.

Referring to one of a profound study of green marketing, Peattie (2001, pg 129) described green marketing as "marketing activities which attempt to reduce the negative social and environmental impacts of existing products and production systems, and which promote less damaging products and services". Anchored to the consensus of the current authors. Peattie (2001) sees green marketing for environmental involved "clean" technology moving towards designing pollution-and-waste less production systems as early as the design stage. Going green and clean deemed to be unseparable given that green adoption will eventually provide a clean environment through pollution and waste elimination with or without physical production. Indeed, it is evident that going green in an intangible manner such as implanting green transformational leadership has a substantial influence to produce clean and green services (Li et al., 2020). Green adoption onto the people, physical evidence and process of the services firm would therefore reduce the negative environmental impact through service facilitation which further nurtures cleaner production.

Green marketing in the new era also concerns with "greenwashing" that a green implementation may not perform as good as expected or does not have an impact at all, yet, an organization immerse with their current state and continuing with the mistake (Szabo and Webster, 2020). Greenwashing deceitfully misleads consumers and affix a certain extent of influence on consumer's perception (Szabo and Webster, 2020). As a result, consumers are confused, and they lost confidence in purchasing green (Martinez et al., 2020). Eventually this deceitful activity brings social influence against the bottom line of green marketing that attempt to reduce social impacts (Peattie, 2001). To avoid unnecessarily blown of consumers' confident from greenwashing, a service people (stakeholders), physical evidence and process that embrace cleaner production would enhance environmental performance and grant effects on better social-quality performance. This will be a significant step towards building a clean organization to defeat the impact of the pandemic.

A reason why a consumer chose one product or service over the other is highly due to their purchase behaviour. Yet, other reason could be explained by the value provided by that product or service, which makes a product or service different from others. In normal circumstances, firm by practising green marketing has significantly draw green market demand which ensures competitive service advantage through its benefit of environmental protection (Leonidou et al., 2013). The green marketing strictly focuses on the integration of environmentally friendly practice to provide remedies for problems related to the environment. Apart from being slightly different in terms of having more restriction on the preventive measures (De Oliveira Santos et al., 2020), the firm which reinforces cleaner production shares the same aim to gain competitive advantage (Zameer et al., 2020). However, in the pandemic or post-pandemic time, cleaner production would offer commitments of "going clean" to capture the market needs, which has expected to seize differentiation advantage in return.

For these reasons, a clean service marketing model would be an ideal way to drive better social-quality performance for a firm's stakeholder, and it may be very relevant to foster differentiation advantage especially in this pandemic and post-pandemic period. Taking this assumption, a conceptual model linking green service marketing mix with social-quality performance and differentiation advantage is structured. Fig. 1 illustrates the conceptual framework for this study.

Based on the figure above, it depicts the proposed relationship showing green people, green physical evidence and the green process has a significant positive influence on both social-quality



Fig. 1. The adoption of cleaner production in service marketing for post-pandemic recovery.

performance and differentiation advantage. The expanded green service marketing mix elements are playing a pivotal role as the cleaner production for service marketing, whereby social-quality performance and differentiation advantage are recommended as the focuses of hotels' post-pandemic recovery. The authors later refer an attempt to embedded cleaner production to the expanded green service marketing mix as "clean service marketing".

3. Methodology

3.1. Research design

The authors adopted mixed-method (qualitative and quantitative methods) in this study through systematic review and field surveys. In precisely, the authors, by adopting a mixed-method, had examined two different groups of research components rather than a single component by multiple methods. For the qualitative methods, a systematic review was carried out to identify the outcome of the green approach to the perception of health or human's health. The data were extracted from two main databases with the considerations of - single and combinations of keywords as well as the inclusion and exclusion criteria. On the other hand, the quantitative methods used survey questionnaires to gather information on the expanded elements of green marketing mix (clean service marketing), social-quality performance and differentiation advantage. The survey questionnaire was administrated based on the previous measurements to outline the questions based on the expanded green marketing mix elements, socialquality performance and differentiation advantage.

3.2. Qualitative data collection: systematic review

To the authors' knowledge, there is a lack of investigation to date has sought to measure the effect of green marketing and its contribution to health value. Hence, a systematic review was carried out to evaluate the extant body of knowledge and answer the proposed research question: "does going green provide health value". The authors by referring to the suggestion of Dangelico and Vocalelli (2015), all the journal articles were sourced from Business Source Complete (EBSCO) and Web of Science due to the high volume collection of academic peer-reviewed articles in business and social sciences. These databases were searched manually using a single or combination of variant keywords on the title and abstract. In the circumstances where both potential title and abstract did not reflect an exact meaning of the keywords, the full article was evaluated to identify the other potential alternative papers. Table 1 below depicted the search result of the keywords in each database with the exclusion of duplicate researches.

The research papers selection takes a few precautions steps to ensure a relevant review. These steps were taken by referring to the inclusion and exclusion criteria as part of the review protocol to ensure transparency that minimizing the likelihood of bias (Kitchenham, 2001). First, the authors screened the title from the databases, and the good relevant papers were retrieved for abstract checking. All the duplicate and non-related articles such as papers written in a language other than English, articles published before 2010 and subjects that cannot be linked to the context of this study were all being omitted. The full-text English journal articles were selected given the completeness of the papers as well as the authors' standard language proficiency that is limited to English. Only articles produced between the year 2010 and 2020 were included because the authors see social media to have a particular impact on the consumer's perception and knowledge on "health" (Yadav and Rahman, 2017). Other than that, 2010 is the year when Malaysia's high-speed internet infrastructure is launched (Bernama, 2010) and also the starting point when Malaysia's mobile social networking is booming. Table 2 below demonstrates the inclusion and exclusion criteria of this systematic review.

As a result, 213 article papers were discarded due to the research area that tends to examine pure sciences more than social sciences, although these papers are focusing on environment and health. Additionally, 40 articles were deleted for the reason of duplication. Further, the terms "greenness health" was accounted for the keyword "green health" given the similar meaning conveyed by the word. The decision ended up with four papers listed in the Web of Science being included in the search result of "green health". The researches proceeded with an in-depth analysis of relevant by reading the full-text papers. Nine studies which found significantly addressed the research questions were selected for the synthesis analysis.

3.3. Quantitative data collection: survey questionnaire

3.3.1. Measurement

The survey questions were designed and divided into five sections. Section 1 comprises of a few screening questions to test the respondents' knowledge of their hotel's green operation. These questions were designed to ensure the samples are the going green hotel firms that can provide valid and reliable answers. Section 2 questioned the level of agreement on the hotel firms' approaches in green people, green physical evidence and green process. Section 3 consists of questions related to the level of satisfaction on the social-quality performance, while Section 4 asked hoteliers about their level of agreement on the hotel's differentiation advantage. In the final part of the questionnaire, Section 5 listed the questions about the respondents' demographic profile. The respondents were

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Table 1

Search result of keywords.

Single Keyword and Its Combinations	Database		
	Business Source Complete	Web of Science	Total
Green Health	1	4	
Environmental Health	54	54	
Green and Health	9	46	
Environmental and health	79	79	
Environment and health and perception	4	58	
Total	146	241	387

Table 2

Inclusion and exclusion criteria.

Items	Inclusion	Exclusion
1	Environmental or green is the main research focus	Environmental or green appears as the peripheral research issue
2	Only full-text articles published in peer-reviewed journals	Conference papers, books, case studies, dissertations and other related articles
3	Non-duplicate article, journal articles that only published once by the same author(s)	All duplicate papers with same or different titles by the same author(s)
4	Articles published in the English language	Articles published in all languages except English
5	Articles published from 2010 onwards (to date)	Articles published before 2010
6	Subject area related to environmental health, sustainability, business and social sciences	Subject related to clinical sciences, pure sciences, or engineering sciences

requested to answer the question on Section 2, 3 and 4 through a rating based on the 5-points Likert scale. There are a total of 25 questions in Section 2, 3, and 4, where 24 questions were adopted from the previous research, and 1 question was self-constructed based on expert judgment.

In summary, all the questions related to green marketing mix except 1 question for the green physical evidence were selfconstructed; the remaining questions were adopted from the study of Akroush (2011). The questions were slightly modified to fit the current context of the study. For the differentiation advantage, items were adopted from Molina-Azorin et al. (2015) and Espino-Rodrigues and Lai (2014); whereas the measurement items for social-quality performance were adopted from Molina Azorin et al. (2015) and Gholami et al. (2013). In Section 5, the respondents were requested to provide their demographic information including age, gender, position, academic background and ethnic groups. The respondents were also asked to provide information about their business location by state. This is a step to ensure the current study covered all regions of Malaysia. The measurement items are attached in Appendix A.

3.3.2. Data collection and sampling procedure

The authors take standard measures to collect data from the going green three-to-five star rated hotels and resorts in Malaysia. The highlights of this group of hotels and resorts are due to the business scale, operation procedures, room numbers and other compulsory requirements that are viewed as necessary in the hotel's green service delivery (Ministry of Tourism, Arts, and Culture Malaysia, 2020). As discussed earlier, the number of hotels registered in Malaysia was recorded as 3200 units. In fact, only 453 units of hotels and resorts are rated as three-to-five star and only 24 of them are registered green firms (Ministry of Tourism, Arts, and Culture Malaysia, 2020). Given this reason, the purposive and snowball sampling method was adopted to identify all other going green hotels and resorts in Malaysia that fall in the set rating category. The hotels and resorts information was sourced from their official website, social media account, national news, directories and other third party information providers for purposive sampling. Other firms were introduced by the respondents, which led to snowball sampling.

With regards, the authors included all the three-to-five star hotel and resort firms in Malaysia as the total population of the study. The G-Power sample size calculator suggested 69 respondents as the ideal sample size; however, with a round of screening and filtering, the authors determined 210 hotels and resorts as the new sample size. Next, the authors initiated data collection with a small scale pre-test study by visiting the manager of 10 hotels as randomly. The comments and suggestions of the respondents were recorded for further revision, and the data were analyzed using Smart-PLS 3.2.8 analytical software for a few reasons. One of the reasons is that Smart-PLS software makes small sample size analysis possible (Ringle et al., 2012) with its high level of statistical power (Henseler, 2010). The actual data collection was conducted after the confirmation of the measurement validity with minor revision on the structure of the questions. A total of 112 questionnaires were distributed online, and 98 were circulated through visitation. Only 43 questionnaires were returned via Google survey and 67 on the field.

The unit of the analysis is the manager who possesses the knowledge for the business operation. This group of respondents is mostly on a tight schedule and prefers online surveys rather than a face-to-face interview. Hence, an online survey was created mainly to cater to the respondents who are unable to meet face-to-face. It took six months to complete the data collected from all regions of Malaysia. These regions include Sabah and Sarawak; Central Region (Selangor, Putrajaya, Kuala Lumpur); East Coast Region (Kelantan, Terengganu, Pahang); Southern Region (Nigeria Sembilan, Malacca, Johore) and Northern region (Perlis, Kedah, Penang Perak). Eventually, 110 questionnaires were collected from the overall samples, yet only 101 were found valid for data analysis.

4. Key findings

4.1. Synthesis analysis

The authors systematically reviewed nine peer-reviewed articles from the selected initially 134 related articles following Moher et al. (2009) PRISMA protocol. These articles were synthesized according to various environmental and health indicators and, notably, none of the studies were found examining the association

between green marketing and health benefits. However, these articles somehow cover a topic related to the green people, green physical evidence and green process elements. Of all the nine articles reviewed, seven studies used purely quantitative methods and the remaining adopted qualitative methods. The synthesis analyses show a significant impact of green activities or decision on human's health, including general health, mental health or perceived health. Van den Berg et al. (2015), Han and Hyun (2019) and Singh et al. (2010) studies on the effect of green space and green production toward perceived health were identified to have a closer research focus that best address the research question of this study. Other studies were also found relevant when the researchers linked green space and health or when the studies provided significant insight that an attempt of green translated into health values. Fig. 2 depicted the PRISMA diagram.

In overall, most of the studies highlighted the association between green physical evidence and health value. Three studies emphasized on nature-based solution reported that the answer applies to the environment is a way to improved employees, customers and survey participants' mental health, mental health value and mental health perception (Vujcic et al., 2017; Han et al., 2020; Han and Hyun, 2019). 2 studies featured green and sustainable buildings described that green building improved human's health situation (Balaban and de Oliveira, 2017; Singh et al., 2010). 2 studies focused on the green spatial dimension revealed that a growing number of green areas enhance health level while escalating numbers of green spaces shape better mental health (Chiabai et al., 2020; Van et al., 2015). Of all studies, 1 study included

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employee's attitude change along with green physical evidence (Singh et al., 2010), and 1 research demonstrated the potential of the green process in strengthening health value (Chiabai et al., 2020).

Moreover, a study by Zaman et al. (2016) had revealed the relationship between health expenditure and emissions. They found that the health expenditures lifted accordingly to the growing amount of emissions. Or in a more severe circumstance, another study disclosed the fact that heating consumptions that lead to excessive emissions during the heating season are the major cause of health endpoints (Li et al., 2019). Both studies provided significant insights that the environmental problem is harmful to human's health. The summary of the research issues and findings is provided in Appendix B.

4.2. Structural equation modeling

Partial Least Square (PLS) approach to Structural Equation Modeling (SEM) was employed to estimate the model of the proposed hypotheses (Hulland et al., 1996). Compared to other approaches, PLS-SEM is appropriate for this study for four reasons. First, this study hypothesized the causal relationship between multiple independent variables and dependent variables. For this, "PLS permits the simultaneous estimation of multiple causal relationships between one or more independent variables and one or more dependent variables" (Kostopoulos, 2011, pp. 1339). Second, the total data obtained for this study is 101 remarks a small sample size. PLS offer an advantage as it has a higher level of statistical



Fig. 2. PRISMA Diagram, adapted from Moher, Liberati, Tetzlaff, and Altman DG (2009).

power (Henseler, 2010) that make small sample size possible (Ringle et al., 2012). Third, the data of this study were collected in a non-probability manner. PLS has mild distribution assumption, and non-parametric that allows bootstrapping procedure, which is appropriate for the data that is not customarily been distributed (Ringle et al., 2012).

Moreover, this study estimated the social-quality performance as the formative model and the rest as the reflective model. PLS allows the estimation of both formative and reflective indicators (Hair et al., 2011) and it was found to be more appropriate to test the formative model compared to the other approaches (Jarvis et al., 2003). SmartPLS 3.2.8 statistical software was performed to evaluate the data obtained (Ringle et al., 2015).

4.2.1. Measurement of common method bias

The assessment of common method bias was carried out through a Collinearity test. Table 3 below shows the result of method variance.

In the language of statistic, collinearity is a standard error where a dependent variable can be mutually predicted by multiple correlated independent variables in a research model (Ramayah et al., 2018). Kock (2015, p.7) suggested a test of collinearity with "the occurrence of an Inverse of Tolerance (VIF) greater than 3.3 is proposed as an indication of pathological collinearity, and also as an indication that a model may be contaminated by common method bias. Therefore, if all factor levels VIFs resulting from a full collinearity test are equal to or lower than 3.3, the model can be considered free of common method bias". Given these considerations, the researchers computed the inner VIF for all variables as observant variables and retained all the variables with VIF below 3.3. The analysis shows all variables have VIF lower than 3.3 indicating no common method bias exists in the current study.

4.2.2. Assessment of measurement model

The analysis was divided into two stages in the form of a path model, as recommended by Anderson and Gerbing (1988). Stage 1 assessment of the measurement model assess the reliability and validity of the constructs. As discussed earlier, the authors had modelled the constructs into the reflective and formative model. In this study, the multi-dimensional constructs of the expanded elements of the green marketing mix and differentiation advantage are reflectively modelled. Social-quality performance, on the other hand, is formatively modelled. These models are distinct in terms of their predictive direction and interchangeability (MacKenzie et al., 2011). Therefore, the ways determining the reliability and validity of the constructs are different (Ramayah et al., 2018). For the reflective model, outer loadings were computed to confirm the linear relationship between the latent construct and the observed indicators of the reflective model. As shown in Table 4 below, all indicators of the reflective model have the outer loadings, loaded above the threshold value of 0.6 (Hair et al., 2016).

Next, the convergent validity was assessed through the Average Variance Extracted (AVE). As shown in Table 4, the AVE values have satisfied the 0.5 rules of thumb ranging between 0.605 and 0.751. Thus, the convergent validity is accepted with no deletion of the

Table 3				
The result of Inverse of Tolerance	for Common	Method	Variance '	Test

Variables	GPeo	GPEv	GPce	DA	SQ
Green People (GPeo)	_	2.091	3.153	1.885	1.380
Green Physical Evidence (GPEv)	2.269	-	2.841	1.955	1.425
Green Process (GPce)	2.810	2.311	_	1.592	1.326
Differentiation Advantage (DA)	2.801	2.644	2.617	-	1.394
Social-Quality Performance (SQ)	2.798	2.717	3.143	1.912	-

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item needed (Hair et al., 2016). Subsequently, the discriminant validity was assessed to tests the extent of the difference between construct (Hair et al., 2016). First, the cross-loading was checked, and only item GPce1 was found to have a difference between the latent variables that is greater than 0.1 (Chin, 1998). Hence GPce1 was deleted. Followingly, the square root of AVE was quantified. The results, exhibits all the square roots of AVE are more significant than the correlation between indicators (Table 5).

However, the researchers had carried out an assessment of Heterotrait-Monotriat ratio of correlation (HTMT) to assess the discriminant validity due to the extensive criticisms that disapproved Fornell and Lacker's criterion (Ramayah et al., 2018). As demonstrated in Table 6, the value of this study is loaded below the threshold value of 0.9, as suggested by Gold et al. (2001). Thus, the Discriminant Validity of the Measurement Model is evident. Further, the construct reliability was tested. The results show that all the composite reliability values are above 0.88, indicating a reliable measurement of the construct to the structural model (Bogozzi and Yi, 1988). The inner Variance Inflation Factor (VIF) was also being assessed to explain the possible measurement error. The inner VIF values of the reflective construct are ranged below the suggested critical level of 5.0 (Hair et al., 2016). Hence, it concluded that no multicollinearity exists.

Moving forward to the formative model, only the outer weight was analyzed to measure the linear relationship between the latent construct and the observed indicators. The satisfactory outer weights obtained are essential in the determination of the possible collinearity issue (Ramayah et al., 2018). As shown in Table 4, the outer weights of the current formative indicator are loaded below the threshold value of 0.5. However, no deletion was made due to the conceptualization of the current performance theory (Ramayah et al., 2018). Further, the outer VIF was asked to explain the multicollinearity of the formative model. All the outer VIF of formative indicators are fallen below the critical value of 5.0, recording no multicollinearity error exist. The satisfactory measurement model permits the assessment of the structural model. Fig. 3 illustrates the research model.

The research model presented both types of measurement model (reflective and formative models) and included all variables of the study. Each exogenous variables have been linked to the endogenous variable to reflect the causal relationship between two variables which form a comprehensive structural model.

4.2.3. Assessment of structural model

The assessment of the structural model is essential as it determines whether the data collected are supported by the hypotheses inferred (Urbach and Ahlemann, 2010). For the evaluation of the structural model, the path coefficients and path determination were tested, follow bootstrap procedures of 5000 bootstrap sub-samples. As illustrates in Table 7, all the expanded 'Ps' elements of green marketing mix were found significant positively related to differentiation advantage at the positive standard beta (β) and t-value greater than 1.65 (significance at p > 0.05) and 2.33 (significance at p > 0.01). Thus, hypothesis H1, H2, and H3 are all supported. Yet, results only show a medium effect size of below 0.15 (Cohen, 1988) indicating a moderate direct effect of the differentiation performance on green people, green physical evidence and green process. For the direct relationship between the expanded green marketing mix elements and socialquality performance, only green process was found significance at the t-value of 1.692 (significance at p > 0.05; $\beta = 0.324$). Hence, hypothesis H4 and H5 are rejected, whereby H6 is supported. Likewise, the effect size of 0.137 suggested a moderate effect of social-quality performance on the green process.

After the evaluation of the direct relationship, the coefficient of determination (R^2) and the predictive relevance (Q^2) were

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Table 4

Construct validity, reliability and multicollinearity measures.

Construct(s)	Items	Outer Loading	AVE	SR AVE	CR	Inner VIF
		Outer Loading	AVL			
Reflective Model						
Green People	GPeo1	0.675	0.658	0.811	0.905	2.014
	GPeo2	0.827				
	GPeo3	0.874				
	GPeo4	0.841				
	GPeo5	0.822				
Green Physical Evidence	GPEv1	0.780	0.605	0.778	0.885	2.357
	GPEv2	0.810				
	GPEv3	0.793				
	GPEv4	0.786				
	GPEv5	0.719				
Green Process	GPce2	0.815	0.751	0.867	0.923	2.081
	GPce3	0.848				
	GPce4	0.918				
	GPce5	0.884				
Differentiation Advantage	DA1	0.841	0.616	0.785	0.888	
	DA2	0.838				
	DA3	0.760				
	DA4	0.798				
	DA5	0.674				
Formative Model						
	Items	Outer Weight	Outer VIF			
Social-Quality Performance	SQ1	0.041	1.868			
	SQ2	0.546	2.382			
	SQ3	0.078	2.274			
	SQ4	0.271	3.163			
	SQ5	0.254	3.374			

Note: AVE: Average Variance Extracted; SR. AVE: Square Root of Average Variance Extracted; CR: Composite Reliability; VIF: Variance Inflation Factor.

Table 5

Fornell and Larcker's criterion.

	Construct(s)	1	2	3	4	5
1	Differentiation Advantage	0.785				
2	Green People	0.591	0.811			
3	Green Physical Evidence	0.665	0.677	0.778		
4	Green Process	0.648	0.621	0.689	0.867	
5	Social-Quality Performance	0.526	0.524	0.497	0.596	

Note: Diagonals (in bold) indicates the squared root of AVE while the other entries represent the correlations. No square root of AVE shown for social-quality performance because it is not required for the formative construct of.

Table 6

Heterotrait-monotrait ratio of correlations (HTMT).

	Construct(s)	1	2	3	4
1	Differentiation Advantage				
2	Green People	0.694			
3	Green Physical Evidence	0.788	0.794		
4	Green Process	0.743	0.705	0.801	

measured, and the results of the path coefficient of determination and predictive relevance were illustrated in Table 8:

The coefficient of determination (\mathbb{R}^2) was assessed to evaluate the predictive strength of the research model. In this study, the differentiation advantage and social-quality performance are the two main interests of the study. Therefore, a substantial amount of variance in these (endogenous) variables is needed for the evaluation of the model strength. As exhibits in Table 5, the \mathbb{R}^2 value of differentiation advantage is 0.525, whereas, the \mathbb{R}^2 of social-quality performance is 0.417. It explains 52.5% and 41.7% of the variability, respectively in differentiation advantage and social-quality performance by the difference in the expanded element of the green marketing mix. Subsequently, the predictive relevance (\mathbb{Q}^2) was measured using blindfolding construct cross-validated redundancy to ensure the prediction accuracy of the indicators data of the endogenous construct. As shown in Table 5, all the Q^2 for the endogenous variable of this study exceeded the recommended value of zero describing good predictive relevance (Chin, 1998).

5. Discussions and contributions

5.1. Improving perceived health and actual health (health values) through clean operations in hotels

The systematic review is however prevailed another fact that health value can be divided into either perceived or actual health value. It further indicates that it is always the matter that either people "think" or green does "really" improved health. The authors had put specific attention on the clean service marketing elements – green people, green physical evidence and green process for the finding of "does green provide health value to a firm's stakeholder". The findings answered the question that adopting green onto space which is referring to the spatial environment of physical evidence (Sreenivas et al., 2013) has a significant impact on perceived mental health (Van den Berg et al., 2015). The perceived health could be shaped through the expanding physical environmental friendly spaces for activities that impart emotional wellbeing (Han and Hyun, 2019) which lead to mental distress, and mental illness relieves (Pun et al., 2018; White et al., 2013).

It is notably that green space should not be limited to the open or close-to-nature places. An improved indoor green environment is as well a significant driver to positive perceived health (Singh et al., 2010) and particularly significant for the "people" who stay in the green "physical evidence" for a more extended period. As elucidated in the study of Singh et al. (2010), the perceived health and wellbeing of an employee is higher when they moved from a conventional workplace to green space. Green workspace promoted a healthy work environment with having more plants, attention to the non-toxic wall paints and cleaning detergents, improved air quality for better air ventilation and temperature, natural light that make people feel safe and healthy. In consequence, the employees' health has improved;



Fig. 3. Research model.

Table 7
Measurement of direct effect

Hypothesis	Path	Std. Beta	Std. Error	t-value	P-value	Effect size f ²	Decision
H1	$GPeo \rightarrow DA$	0.168	0.094	*1.825	0.039	0.031	Supported
H2	$GPEv \rightarrow DA$	0.336	0.096	**3.491	0.001	0.101	Supported
H3	$GPce \rightarrow DA$	0.313	0.095	**3.285	0.001	0.097	Supported
H4	$GPeo \rightarrow SQ$	0.197	0.178	1.107	0.134	0.042	Not Supported
H5	$GPEv \rightarrow SQ$	-0.026	0.181	0.141	0.444	0.002	Not Supported
H6	$GPce\rightarrowSQ$	0.324	0.191	*1.692	0.045	0.137	Supported

Note: * denotes t-value>1.65 significance at p > 0.05; ** denotes t-value>2.33 significance at p > 0.01; Std. Beta: Standard Beta (β), and Std Error: Standard Error; GPeo: green people; GPEv: green physical evidence; Pce: green process; DA: differentiation advantage; SQ: social-quality performance.

Table 8

Coefficient of determination and	l predictive relevance.
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Endogenous Variables	R ²	Q ²
Differentiation Advantage	0.525	0.295
Social-Quality Performance	0.417	0.222

Note: R^2 : coefficient of determination; Q^2 : predictive relevance.

they can show up to work more frequently and generated more efficient work hours (Singh et al., 2015). On the other hand, green indoor and outdoor physical surroundings are one of the most critical naturebased solutions for the hotel to boost a hotel's occupancy rate, the emphasis of nature attained desired outcome of green to satisfying green customers' desire and contribute to improving human health (Vujcic et al., 2017).

The previous findings highlighted a crucial fact that green physical evidence could facilitate green people, and people with green intention could co-operate green physical evidence to generate positive perceived health among stakeholders (employees and customers). Thus, it explains that green people and green physical evidence can be a significant enhancer for stakeholders' health value. However, when the impacts of green people and green physical evidence on perceived health were identified (Van den Berg et al., 2015; Singh et al., 2015; White et al., 2013), the impact of green process elements on perceived health is unclear. The authors argued that the existing literature does exhibit a likelihood of a green process to influence human's health as there are certain adjustments to green is required for the implementation of green activities, and the flow of implementation that takes place is a "process" (Bhasin, 2019). All along, there has been negligence of the variation of the proposed green approach as to where the green process exists. At the same time, most of the previous attention has been posited on the green elements that provide health value. The current study is, therefore, emphasis the entire flow of green

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implementation as a green process and makes known its impact on human's health through green adaptation.

In overall, the result of the current systematic review had answered the first research questions that a firm's by incorporating cleaner production to its green service marketing could provide health value to its stakeholder. The findings further supported the finding of Dangelico et al. (2017) and Moroles et al. (2020) that marketing strategy alone is insufficient to drive certain outcome and the authors had extended the previous studies with the additional "clean" role given to the green marketing strategy. Therefore, it suggested hotel and resort firms adopt green into their people, physical evidence and process to provide a health benefit to its employee as well as travellers after the pandemic to increase the travellers' confident of travelling. A healthy image of an employee is crucial as the employee could directly represent a firm's image. Employees of a firm can easily shape consumer perception towards the brand or the organization because they are the interface between the brand's internal and external environment (McDonald et al., 2001). The current study also makes a significant contribution to the existing green marketing literature revealing the relationship between green marketing and health value.

5.2. The significant impact of clean service marketing on socialquality performance

As far as the authors' concern, the research examining the direct effect of hotels and resorts' green service marketing on social quality performance is scarce. Neither of the previous research had investigated the expanded elements of the green marketing mix, nor prior research integrate it as an implication of cleaner production that would drive a firm's social-quality performance. Despite the novelty of the current study that examined firm's social-quality performance through clean service marketing, previous studies hinted the significant association among green physical evidence (Han and Hyun, 2019; Vujcic et al., 2017) and green people (Wen and Li, 2013) with social wellbeing. However, the current findings were asymmetric to the mainstream studies that only green process was found to be the sole element of the expanded green marketing mix that is significantly related to social-quality performance. As such, the green process is the most critical factor operating a service (Pomering and Johnson, 2018) that lead to a firm's social-quality performance. Having that being said, going green in the service delivery is an essential implication of clean service process to ensure employees' welfare, service quality and corporate image as part of the post-pandemic recovery.

Although green physical evidence was found to be not significant towards social-quality performance, the future study may need to focus on the definition or coverage of the construct because covering the whole system from the operations, productions until the end product reaches the end consumer compare with only focusing on the tangible and intangible component of a hotel environment for the consumer (Lovelock et al., 2015) may have differing priorities (Ehmke, 2008) and gives the research a different set of results. Physical evidence may be more attractive to future travellers because they need to be reassured and reminded that the place they will be spending the night will have all the necessities for them to have a peace of mind. The same should also be done for green people categorization because by understanding more about this group, hoteliers can be more prepared in the future to meet with the group expectation. Post pandemic, a new type of hotel customers may have special request before even thinking of staying in a hotel, for example, a sanitize room and the users are among closed knitted customers of the hotel only that will have access of specific accommodations.

5.3. The significant effect of clean service marketing on differentiation advantage

In the direct relationship between green people and differentiation advantage, the undertaken empirical finding is symmetrical to Lovelock et al. (2007) that people element is the factor influencing differentiation advantage. The results of the data analysis supported the previous finding of Okumus et al. (2019) viewing the green knowledge educated, sense of green responsibility nurtured, green motivation inspired, and green culture implied to the employees as different in terms of practices if compare to the other non-green firm. An employee who has the green knowledge and assigned green responsibilities assimilated into cleaner production will be responsible for keeping the hotel services "clean" and fulfilling the new "clean" demand after the pandemic. The travellers who have auxiliary demand that urged an additional or diminishing supply from the hotel and who care about the environment (Kim and Han, 2010) will appreciate the green contribution of the hotel's employee and see them as different from the other market players. In return, the clean service provided would benefit hotel firms with a differentiation advantage.

For the second element of the expanded green marketing mix, the current analysis indicates a significant strength of the hotels and resorts' green physical environment with a profound effect on the differentiation advantage. As discussed, the hotel's physical environment does not only limit to the visible environment or certain selected areas (Eneizan et al., 2016), it includes the invisible aspect like the affection created, sound and ambience (Lovelock et al., 2015) which facilitate green service transaction among the hotel guests and form profound perception (Salman et al., 2017). Taking green physical evidence as an implication of cleaner production, "clean" physical evidence provides the most direct experience to the travellers as it involves in everywhere so long as the travellers have a physical presence in the hotel or resort premises. The "clean" physical evidence (for example, un-crowded natural surrounding) might not be possible to be provided by any other hotel firm; thus, it provides differentiation advantage to the hotel firms.

The third element of the expanded green marketing mix green process was also found to be positively related to differentiation advantage. Previous researches unveiled the role of the green process from the customer perspective that service delivery with the "green element" in it had shaped significant differentiation (Mullick and Khan, 2011). For instances, the lobby and counter used to facilitate the interaction between travellers and employees are disinfected specifically with environmental friendly sanitizer; or the method of service delivery is clean where the self-service machine is prohibited to avoid travellers expose with unnecessary risk and front-desk employees provide green contactlessand-distance service to avoid unnecessary personal contact; may not be found elsewhere could enhance firm's differentiation advantage. Green process refers to the right methods of delivering a product or service with its green objectives (Kumar and Rohtak, 2014). Therefore, accommodating cleaner production into hotel's process stipulates an integration of "clean" into hotel's objectives; products and whole operation process in the service delivery would add value to the travellers and make a firm different from the other. The "clean" process that is unique would be able to pin the "clean" perception among the travellers, especially during and after the pandemic.

By introducing green service marketing as an implication of cleaner production, the current authors had contributed to green marketing and cleaner production literature. It added new evidence to the previous literature that other than green production, creativity and green brand image (Zameer et al., 2020), greening

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services marketing is another implication of cleaner production that could effectively enhance firm's differentiation advantage. Hence, it is highly recommended as a way forward to hotel and resorts' post-pandemic recovery.

6. Conclusion

Previous empirical evidence shows diverse driving forces for firms to adopt cleaner production. Some firms were focusing on environmental factors, others for non-environmental elements or a few aim breakthroughs for both aspects (Groening et al., 2018). It has been a suggestion that cleaner production carries a hedonic value that consumers are willing to pay more for the green product produced (Mantovani et al., 2017). The adoption of cleaner production technology somehow provides a means of market competitiveness as a firm will grant an advantage over its social incentives which spurred pro-environmental behaviour (Groening et al., 2018; Mantovani et al., 2017). Other non-environmental reason includes the safety and health factors derived from the pollution minimization (Unnikrishnan and Hegde, 2006). Future services of hotel star rating status may no longer be measured based on the number of rooms or facilities provided, but the health safety level and clean preparedness of the employees that the service can guarantee to entice patrons that are willing to pay top dollars for these services. The business industry as a whole has learned during this pandemic that decisions must be made and the world economy cannot remain at a full halt.

Based on the result of the current analysis, the authors recommended hotel and resort firms to adopt green as an implication of cleaner production for significant benefits on health and health perception to its stakeholder. In additions, green people and green physical evidence should be implemented synchronously to achieve better health perception (Van den Berg, 2015; Singh et al., 2015). By addressing this matter, some of the stress and unnecessary anxiety may be reduced, provided people perceived the clean hotels or resorts as less harm to human health after the pandemic. Furthermore, to the social-quality performance and differentiation, it requires a careful combination and utilization of marketing mix in producing the most viable mix although it has been widely recognized as the fundamental of marketing (Kumar and Ghodeswar, 2015). Indeed, a firm needs to stay focus on the most appropriate mix and make the relevant decision for a more effective outcome.

Moreover, the authors found that traveller's opinion on hotel clean service marketing would be useful for future study. The study could not find out whether or not "clean" service marketing rather than "green" would have a more profound effect in building positive health safety image for a hotel or resort. Therefore a comprehensive study is recommended.

In conclusion, hotel and resort firms by adopting green to the service's people, physical evidence and process as the implication of cleaner production does provide a "clean" image to the firm and further permitting differentiation advantage (Okumus, Köseoglu and Chan et al.; Salman et al., 2017; Mullick and Khan, 2011). However, more intensive attention should be given to a clean process for better social-quality performance. It is highly recommended that the hotel and resort firms taking green consideration to defeat the pandemic strikes, given that green attached with a clean meaning could shape firms' health value, lead to differentiation advantage and enhance social-quality performance.

CRediT authorship contribution statement

Tiong Ying Ying: Conceptualization, Methodology, Validation, Writing - original draft. **Stephen Laison Sondoh:** Jr, Supervision, Methodology. **Geoffrey Harvey Tanakinjal:** Writing - review & editing. **Oswald Aisat Iggau:** Supervision, Funding acquisition.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jclepro.2020.124621.

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