



Research Article

Fostering CSR Sponsorship in China: A Conceptual Framework for Cultivating Sustainable Behavior among Ant Forest App Users via Internet Platforms

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Abstract

Ant Forest has emerged as a prominent pro-environment advocate, amassing a user base of 650 million individuals. However, the sustained engagement of its users is crucial for its enduring success. To ensure the continued viability of Ant Forest, it is imperative to foster and maintain users' pro-environmental behaviors over an extended period. Central to Ant Forest's appeal are its gamification features and interactive elements linked to CSR sponsorship. This study aims to investigate the potential of these distinctive characteristics within an Internet platform to enhance users' awareness of sustainability issues and prolong their engagement. As part of a comprehensive inquiry into the role of Chinese Internet Platform Companies such as Ant Forest in shaping users' attitudes and behaviors towards sustainability, this research endeavors to ascertain whether these platforms fulfill their responsibility in offsetting carbon emissions. The present findings are from a thorough desktop survey focusing on key themes related to the Ant Forest app, including the maintenance of users' sustainable behavior and the enhancement of CSR sponsorship. Utilizing the EAGLE System, an online research platform, we meticulously documented the synthesis of literature reviews and adapted the findings for presentation. Our analysis identified CSR-linked sponsorship, the sustainability of Chinese Internet Platform Companies, users' behavior, and users' attitudes as potential independent variables. Furthermore, we identified the gamification mechanism and interactivity as moderator variables influencing users' engagement with their responsibilities in carbon emissions offsetting. Notably, Chinese Internet platform companies have the potential to positively influence users' attitudes and behaviors towards sustainability by integrating gamification, interactivity, and CSR-linked sponsorship into their platforms. Harnessing these features effectively may empower Internet platforms to instill sustainable habits among users, thereby laying the groundwork for a conceptual framework termed the Users' Sustainable Awareness Model.

Keywords: sustainability; CSR-linked sponsorship; users' attitude and behavior; offsetting carbon emissions

Introduction

Improving awareness and nurturing commitment are crucial aspects of addressing environmental issues. Approaches include adopting CSR and sustainable practices which are found could facilitate emerging economies' integration into the global economic and political system (Saifulina et al., 2022). It is widely acknowledged that corporations have a significant impact on environmental degradation (Robertson & Barling, 2015). Customers' perspectives have transformed as a result of growing social and environmental consciousness, resulting in a rise in demand for ecologically sustainable and morally sound goods and services (Martínez García de Leaniz et al., 2019). The focus of CSR today has shifted from a shareholder-first perspective (Friedman, 1970) to a stakeholder-focused perspective (Freeman, 1984), in which CSR efforts towards non-shareholding stakeholders (such as clients, staff, and suppliers) are seen as investments that can improve the result profitability (Feng & Tseng, 2019). Kesavan et al. (2013) define CSR as "both accountability and commitment by a corporation to enhance a community's well-being through the use of business resources such as money, employees, and facilities". Tingchi Liu et al. (2014) define CSR as a company's actions and standing in relation to its obligation towards the environment, its stakeholders, as well as the community upon which the issue works.

Due to stakeholder pressure, businesses throughout the globe are implementing environmentally responsible practices and reducing their environmental impact in order to resolve these issues (Wolff et al., 2018). Modern businesses engage in CSR in response to pressure from a variety of stakeholders, including customers, competitors, and governments, who want them to engage in long-term initiatives for the improvement of society and the environment (Kamal, 2021). Internet sectors in general, and the most prominent Chinese online platform businesses mentioned in The Global Digital Economy White Paper (2022) in particular, are not an exception. China, the biggest developing country in the world, actively promotes a green philosophy and way of life among its people. Its Internet+ programme enables citizens to contribute to the public good through innovative mobile application platforms. Ant Forest, a smartphone

application with over 650 million users released in 2016 and based on the Alipay platform, bolsters environmental well-being by fostering low-carbon behaviour for citizens through social engagement and gaming enjoyment (Ant Group, 2023).

Even though Ant Forest has had significant initial accomplishments, its long-term achievement is contingent on the continued participation of its users, and its ultimate goal aims to support their environmentally friendly actions. Consequently, it has become necessary for increasing users' sustainable awareness in order to promote Ant Forest's sustainability among Chinese Internet platform companies. This study will propose a conceptual framework for how Ant Forest App maintains the sustainable behaviour of its users in order to increase CSR sponsorship among Chinese Internet platform companies.

Methodology

The purpose of a conceptual paper is to link and integrate existing theories and concepts in order to provide multidisciplinary insights into a phenomenon (Cropanzano, 2009). A conceptual paper is an appropriate method for investigating a novel, multivariate phenomenon. We begin by describing the current state of knowledge and examining pertinent research questions. This paper proposes a conceptual framework for how Ant Forest App maintains users' sustainable behaviour in order to increase CSR sponsorship among Chinese Internet platform companies. We obtained empirical studies published in Scopus, Web of Science, and Google Scholar through the use of numerous keywords to identify relevant articles. The keywords associated with the selected major themes, such as Interface features of Ant Forest, Ant Forest's function, users' purpose in using the Ant Forest App, types of sustainable behaviour, theories to maintain behaviour, sustainable user purpose function theory for CSR sponsorship, a model for sustainable users' purpose function in generating CSR sponsorship, and a framework for sustainable users' purpose function in generating CSR sponsorship, which were discovered utilising Ibrahim's (2020) research questions' construct categorization technique for identifying three distinct RQ Constructs - "WHO", "WHAT", and "HOW" - in formulating the primary research question. Ibrahim defines "WHO" as the element impacted by the study,

"WHAT" as the information or corpus of knowledge necessary to solve the problem, and "HOW" as the intended impact of the study.

The literature review study adheres to the "Systematic Literature Review Synthesis Process" (Ibrahim and Mustafa Kamal, 2018) outlined in Masiran et al. This process is a literature review typology known to make sense of a selected body of existing literature leading to decisions about the background theoretical context in an early research ideation phase. We selected the 42 most relevant articles.

This study will present, for each topic, the main works of previous scholars, how their works could support future research, and what aspects

of each designated topic require improvement. The intended consequence of this research is a synthesis of each subject area. The study will then address cross-analysis and integrated possibilities, as well as rank the synthesised information in order to provide highly probable solutions for enhancing users' sustainable awareness. Next, the study will present the main results using the "POD (Point of Departure) Tree Diagram" adapted from "Templates for Thinking" by Ibrahim & Mustafa Kamal (2018). This study utilised the online EAGLE System to document the literature review synthesis procedure and adapted the results for reporting. Figure 1 shows the workflow how the study adapted Ibrahim & Mustafa Kamal (2018) approach to conduct the study.

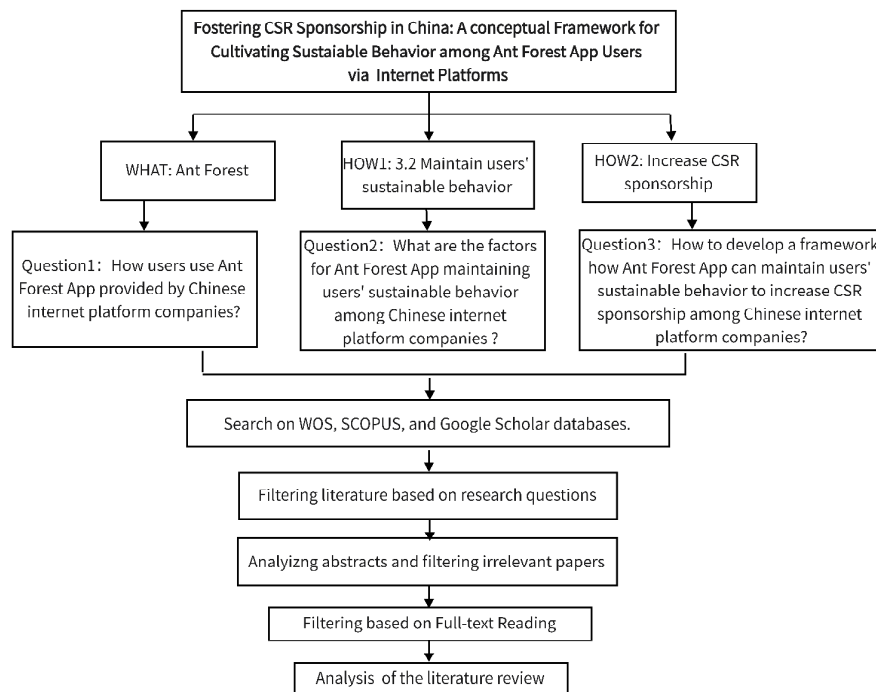


Figure 1. The workflow of the systematic literature review synthesis process for current study.

Literature Review

Ant Forest App

Interface features Ant Forest

According to Huang et al. (2023), the Ant Forest social media app serves as a case study for the impact of eco-friendly advertisement on the link within gamification and sustainability buying habits. Zhou et al. (2021) mentioned the factors

influencing the sustained use of gamified mobile app services. According to Bruckermann (2022), it's important for businesses to remember while adopting green projects that gamification experiences and perceived enjoyment are not moderated by green advertising, but rather are moderated by perceived enjoyment and sustainable consumption. The method for how gamified IS (immersive-related interaction, achievement-related interaction, and social-related interaction) influences individuals' believed advantages and continuing intent was

highlighted by Zhou et al. (2021). Using digital applications, Bruckermann (2022) developed a unique area of private carbon accounting systems that shifted the burden of carbon emissions, money saved, and credits to the consumer-citizen. Huang et al. (2023) made effort to encourage sustainable behavior within China's youngsters, however, primarily focused on limiting the gamification sensation. However, Zhou et al. (2021) only examined the impact of gamified IS on users' perceived benefits and retention intent. However, Bruckermann (2022) only concentrated on the innovative field of carbon accounting schemes for individuals.

Function of Ant Forest

According to Zhang et al. (2021), Ant Forest and land restoration in China are examples of how fintech is contributing to sustainable development in the digital era. Yang et al. (2018) found that when users of Ant Forest embraced greener lifestyles, their behavior changed. Wang & Yao (2020) claimed that gamification design may encourage pro-environmental behaviors by identifying essential components in Ant Forest. Chen & Cai (2019) described Ant Forest through pollution as a case study of utilized gaming for interactive communication about the environment in China. According to Cao et al. (2022), an examination of gamification in a well-known online payment platform in China shows how gamified collaboration and competitiveness inspire low-carbon activities. According to Zhang et al. (2021), Ant Forest offers a wide range of potential uses for achieving sustainable development goals, such as improving human health, reducing carbon emissions, and restoring lands. Ant Forest is a cutting-edge persuasion platform combining online communication and gamification aspects that promotes public engagement in such environmental welfare, according to Yang et al. (2018). Wang and Yao (2020) emphasized the effects of gamification design features that are strongly connected with environmental sustainability in Ant Forest (for example, green setting, pro-environmental behaviors, and planting a tree). Users also express more satisfaction when they get both virtual medals and official diplomas, although socializing and competition-related aspects are of less significance. The effectiveness of Ant Forest in pro-environmental communication and its ability to inspire the general people to participate in pro-environmental actions were examined by Chen & Cai (2019). Cao et al. (2022) used goal-framing theory to investigate how competition and collaboration, two popular

gamified interactions, affect their low-carbon behavior. However, Zhang et al. (2021) primarily focused on the development history and workings of Ant Forest. However, Yang et al. (2018) only looked at how perceived persuasiveness, the feeling of success, and perceived amusement mediated the effects of main user-driven task assistance, credibility, and social backing on the user's desire to keep using Ant Forest. However, Chen & Cai (2019) only looked at how Ant Forest influences Chinese users' environmental awareness and behavior. The incentive impact of collaboration was much stronger even though Cao et al. (2022) primarily focused on cooperative and competitive interactions that might promote low-carbon behavior among users. Furthermore, Users' conventional, hedonic, and profit incentives to engage in environmentally friendly behaviors were bolstered by interactions that facilitated cooperation, whereas competitive encounters predominantly awoke hedonic and gain motivations.

Users' purpose of using Ant Forest App

According to Ashfaq et al. (2021), user experience, personal traits, and motivational variables, all have a role. Ant Forest, a green behavior mobile app in China, has been the subject of an empirical investigation by Zhang et al. (2020). According to Wang et al. (2022), there are several factors that encourage users of Alipay to take part in the Ant Forest initiative. To better understand the new and mostly unexamined phenomena of Ant Forest, Ashfaq et al. (2021) built and tested a conceptual framework. To explain why some people keep using Ant Forest and others don't, Zhang et al. (2020) presented a developed and tested theoretical model that centers on satisfaction with Ant Forest and its causes. According to Wang et al. (2022), the Ant Forest project is successful because it appeals to both the extrinsic and the internal motives of Alipay users. Users' first impressions of Ant Forest and their desire to keep using it were investigated using BRT by Ashfaq et al. (2021), who found that users' environmental literacy had a moderating influence. However, Ashfaq et al. (2021) only looked at the impact of the user interface, individual characteristics, and inspiring aspects of gameplay on the desire to keep playing Ant Forest. Users' intentions to keep using Ant Forest were the only focus of Zhang et al. (2020). However, Wang et al. (2022) only looked at what aspects affect Alipay users' engagement with Ant Forest and how satisfied

they are with the experience. Ashfaq et al. (2021) only evaluated a small set of factors in their attempt to clarify Ant Forest uptake within a set of environmental concerns.

Maintain users' sustainable behavior

Types of sustainable behavior

According to Sullivan et al. (2021), there has been no systematic analysis of how consumers' hopes and fears about environmental sustainability programs affect restaurants' bottom lines. S. Wang et al. (2022) quantified the effects of the 'Internet plus Ecology' paradigm on carbon sinks in the digital age. To fight global warming and achieve zero emissions in China, S. Wang et al. (2022) emphasized that Ant Forest uses an accurate and motivating "Internet plus Ecology" framework by raising individuals' low-carbon awareness to decrease greenhouse gases and by boosting forest NPP to raise the level of the carbon basin. Although managing for confusion in the individual stage and the action level, three multilevel studies highlighted by Brick et al. (2017) showed that environmentalist identity estimated pro-environmental behavior far better for high-visibility behaviors. However, Sullivan et al. (2021) narrowed their attention to ecologically responsible methods of food service. Brick et al. (2017), on the other hand, focused only on American respondents to their three correlative surveys of self-reported pro-environmental behavior utilizing the Recurring Pro-environmental Behaviour Scale. The study hypothesizes the following:

H1: Responsibilities towards offsetting carbon emissions will improve when CSR-linked sponsorship increases.

H2: Responsibilities towards offsetting carbon emissions will improve when CIP sustainability increases.

H3: Responsibilities towards offsetting carbon emissions will increase when users' behavior improves.

H4: Responsibilities towards offsetting carbon emissions will increase when users' attitude improves.

Theories to maintain behavior

Hosta & Zabkar (2021) stressed the environmental and social RSCB background information, as well as the commitment to behave in an ecologically socially responsible

way. Using a structural equation model, B. Chen et al. (2020) examined individuals' behavioral drives for engaging in virtual initiatives aimed at protecting the environment from all four aspects of sustainability consciousness, societal incentive, online submersion, along with collaborative purpose, and how people's motivation to join international efforts to combat climate change was greatly boosted by the events. Berger et al. (2022) stressed an information system design viewpoint that connects digital pushing components to contextual choice types and illustrates the efficacy of their integration. Chang et al. (2022) investigated the warming awareness, adjustment intent, and habits of PEB among Taiwanese visitors using the theory of planned behavior. Hosta & Zabkar (2021), on the other hand, exclusively stressed responsible sustainable consumer behavior (RSCB). Chen et al. (2020), on the other hand, solely looked at evidence that digital technology may successfully boost people's environmental protection intents. Chang et al. (2022) focused only on tourists' impressions of climate change at Taiwan's XNEA.

Increase CSR sponsorship

Sustainable user purpose function theory for CSR sponsorship

According to Xiong et al. (2022), Alipay's "Ant Forest" in China was considered as an example to state the influence of incentive mechanisms and suit degree on user environmental behavior. According to Mi et al. (2021), playing Ant Forest to encourage online green behavior is a fresh viewpoint on uses and rewards. According to Demirel (2020), CSR in sport sponsorship influences customers' opinions of a sponsoring brand's CSR. Xiong et al. (2022) investigated the impact of a reward system and level of fit on users' environmental behavior using the stimulus-organism-response theory and the self-determination theory. Mi et al. (2021) investigated the psychology behind the formation of continuous use behaviors among Ant Forest users by extending the use and gratifications theory. Demirel (2020) emphasized the need of researching the link between professional sports team sponsorship and customer views of a sponsoring brand's social responsibility. Xiong et al. (2022), on the other hand, solely looked at the influence of economic, worth, and social incentives on user environmental behavior. Mi et al. (2021) solely looked at the theory of use and pleasure.

Demirel (2020) concentrated only on professional sports organizations.

Model for sustainable users' purpose function in generating CSR sponsorship

S. Wang et al. (2022) lead an empirical study about motivating factors encouraging Alipay Users to engage in the Ant Forest initiative. Alzaidi & Iyanna (2021) created a conceptual framework for ecologically sustainable volunteer worker behavior. According to Zacher et al. (2023), the foundation of environmentally friendly organizations is worker green behavior. According to B. Zhang et al. (2022), social media encourage environmentally friendly behavior. Doing good for society, Ashfaq et al. (2022) stated a structural equation modeling-artificial neural network method for assessing the impact of green technology acquisition on consumer green behavior. According to S. Wang et al. (2022), extrinsic and intrinsic reasons drive Alipay users to engage in the Ant Forest. Li et al. (2023) propose a joint optimization technique based on PSO-1DCNN for measuring the impact of online information about corporate responsibility validity on customers' intentions to buy in social media on the Internet platform. To better understand workers' voluntary pro-environmental behavior, Alzaidi & Iyanna (2021) underlined the significance of developing a conceptual framework centered around a holistic strategy. Zacher et al. (2023) stressed the significance of building a comprehensive conceptual framework of EGB as the cornerstone of organizational ecological sustainability. B. Zhang et al. (2022) noted that they apply value theory and create a study model to investigate how the beliefs of Ant Forest users impact their dispositions toward the environment. Ashfaq et al. (2022) stressed the development of an integrated framework to grasp users' continuation intention towards Ant Forest. However, Alzaidi & Iyanna (2021) only looked at the model to get a better understanding of workers' voluntary pro-environmental conduct. However, Zacher et al. (2023) only looked at employee green behavior. To comprehend Ant Forest users, Ashfaq et al. (2022) relied only on an artificial neural network. This study hypothesizes the following:

H5: Controlling gamification mechanism, responsibilities towards offsetting carbon emissions will improve when CSR-linked sponsorship increases.

H6: Controlling gamification mechanism, responsibilities towards offsetting carbon

emissions will improve when CIP sustainability increases.

H8: Controlling gamification mechanism, responsibilities towards offsetting carbon emissions will increase when users' attitude improves.

H9: Controlling interactivity, responsibilities towards offsetting carbon emissions will improve when CSR-linked sponsorship increases.

H10: Controlling interactivity, responsibilities towards offsetting carbon emissions will improve when CIP sustainability increases.

H11: Controlling interactivity, responsibilities towards offsetting carbon emissions will increase when users' behavior improves.

H12: Controlling interactivity, responsibilities towards offsetting carbon emissions will increase when users' attitude improves.

Framework for sustainable users' purpose function in generating CSR sponsorship

White et al. (2019) proposed a research review and a guiding framework on how to alter consumer behaviors to be more environmentally friendly. Chi et al. (2020) investigated environmentally friendly actions in the collaborative economy in the context of China's bicycle-sharing. White et al. (2019) emphasized the need of building a comprehensive framework for understanding and fostering long-term consumer behavior change. Bhuiyan et al. (2022) stated that evaluating further validates respondents' perceptions of Islamic banks' CSR operations in terms of social betterment, health and academic achievement, financial wellness, and current cultural and artistic activities. However, White et al. (2019) limited their study to customers who are more likely to participate in pro-environmental activity. However, Chi et al. (2020) concentrated only on the bicycle-sharing industry and Bhuiyan et al. (2022) solely looked at Islamic banks' CSR initiatives.

Discussions

This article examines various aspects of Ant Forest, including its interface features, functions, and users' purposes, as well as the types and theories of maintaining sustainable behavior. It also explores theories, models, and frameworks related to sustainable users' purposes and functions in generating CSR sponsorship. The study examines and discusses these characteristics, breaking them down into

six sections to answer the research goals and provide recommendations.

Following the aforementioned research, Point of Departure 1 (POD1) was developed: Ant Forest can promote sustainable behaviour by engaging its existing and potential users through a gamification mechanism and interactivity so that they are content with their responsibilities for reducing or offsetting carbon emissions. Attitudes and measures towards environmentally sustainable initiatives, information availability, dimensions of awareness, personal social norms, identities and motivation, contextual factor, perceived consumer control effectiveness, ethical ideologies obligation, online immersion, global cooperation intention, and digital technology can maintain users' sustainable behaviour. This study combined the mechanism and interactivity of Ant Forest with the factors that maintain users' sustainable behaviour in order to completely comprehend their characteristics. Consequently, this study developed POD4: by integrating gamification mechanism (behaviour, notion, features, perception, sustainability, quality, graphs, text, etc.) and interactivity towards CSR-linked sponsorship, Chinese Internet Platform Companies could improve the attitude and behaviour of users towards sustainable behaviour.

From the aforementioned research, POD2 was derived: attitudes and measures towards various factors can maintain users' sustainable behaviour. POD3 was as follows: the message or context leverages psychological factors based on the stimulus-organism-response theory, self-determination theory, the expectation-confirmation model, and the task-technology fit model in order to influence the user's sense of self-determination, sustainable behaviours, and continuous use intentions. Combining the influencing factors with the user's sense of self-determination, sustainable behaviours, and continued use intentions, as well as the stimulus-organism-response theory, the self-determination theory, the expectation-confirmation model, and the task-technology fit model, this study developed POD5: users' sense of self-determination and sustainable behaviours and continuous use intentions are influenced by initiatives or message or context that leverages psychological factors.

This study examined the factors that influence users' perception of autonomy, sustained behaviours, and intentions for continued use.

These were combined with Ant Forest mechanisms that promote sustainable behaviour, including gamification and interactivity. Consequently, this study developed POD6: Ant Forest can encourage sustainable behaviour by influencing its existing and potential users to be engaged through gamification mechanism and interactivity using the message or context that leverages psychological factors based on the stimulus-organism-response theory, self-determination theory, the expectation-confirmation model, and the task-technology fit so that they are satisfied with their responsibilities towards saving or offsetting.

This study incorporated the content of POD4 and POD5, concentrating on Sponsoring CSR for sustainable behaviour and the impact of sustainable user behaviour factors. This study therefore proposed POD7: by integrating gamification mechanism (behaviour, notion, features, perception, sustainability, quality, graphs, text, psychological factors based on the stimulus-organism-response theory, self-determination theory, the expectation-confirmation model, and the task-technology fit mode, etc.) and interactivity towards CSR-linked sponsorship, Chinese Internet Platform Companies could improve users' attitude and behaviour towards sustainable behaviour.

POD5 and POD6 share many elements, such as the fact that the influence of initiatives, messages, or contexts on sustainable behaviour leverages psychological factors. Consequently, this content is the focus of this study. Combining POD5 and POD6, this study created POD8: Ant Forest can encourage sustainable behaviour by influencing its existing and potential users to be engaged through gamification mechanism and interactivity using the message or context that leverages psychological factors based on the stimulus-organism-response theory, self-determination theory, expectation-confirmation model, and task-technology fit so that they are satisfied with their responsibilities towards sustainability.

This study identified the commonalities between POD7 and POD8 and then combined their respective perspectives. The study summarised and analysed the gamification mechanism and interactivity towards CSR-related sponsorship, as well as their effect on enhancing the attitude and behaviour of users towards sustainable behaviour. Consequently, the study proposed the following final POD9: By

integrating gamification mechanism and interactivity towards CSR-linked sponsorship, Chinese internet platform companies such as Ant Forest have the potential to positively

influence users' attitudes and behaviors towards sustainability, thereby encouraging them to fulfill their responsibilities in mitigating or offsetting carbon emissions.

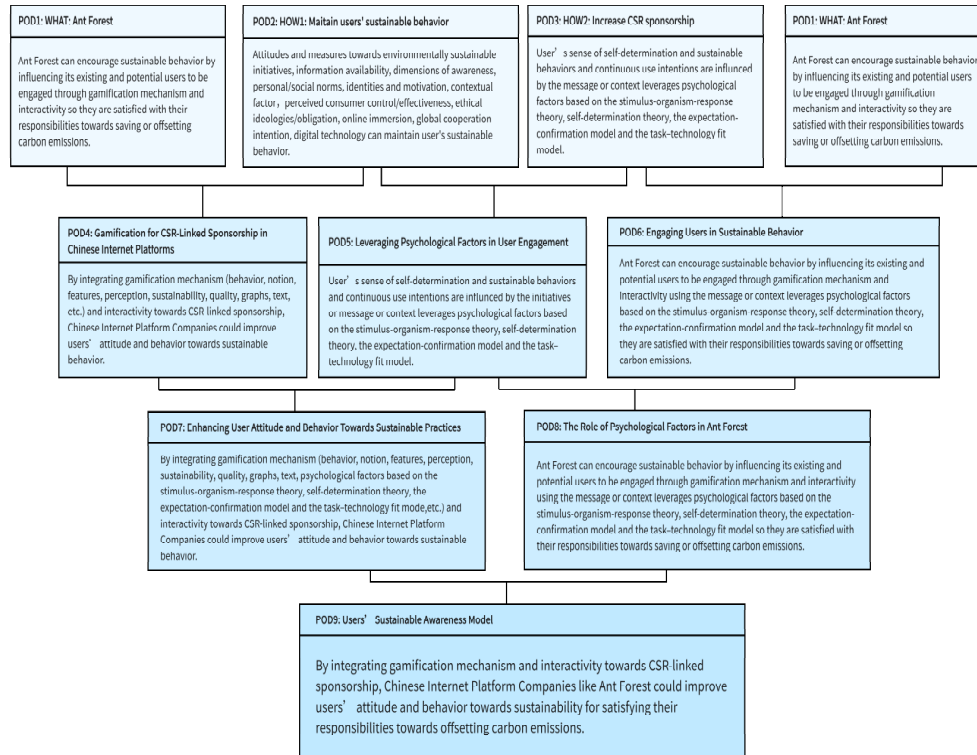


Figure 2. Point of Departure (POD) Tree Diagram for Users' Sustainable Awareness Model (Adapted from Ibrahim & Mustafa Kamal, 2018)

This article examines the Interface features, Function, Users' purpose of Ant Forest and types, theories of maintaining sustainable behavior and the theory, model, framework for sustainable users' purpose function in generating CSR sponsorship. The research investigated and reviewed these three characteristics, which were then merged in six phases to address the study's requirements. The

goal was to assess the benefits and drawbacks of combining opinions and to provide recommendations based on this research. Figure 2 above how the literature review synthesis develops the proposed theoretical proposition for a Users' Sustainable Awareness Model on improving users' sustainable awareness conceptual framework was further developed from this theoretical proposition in Figure 3.

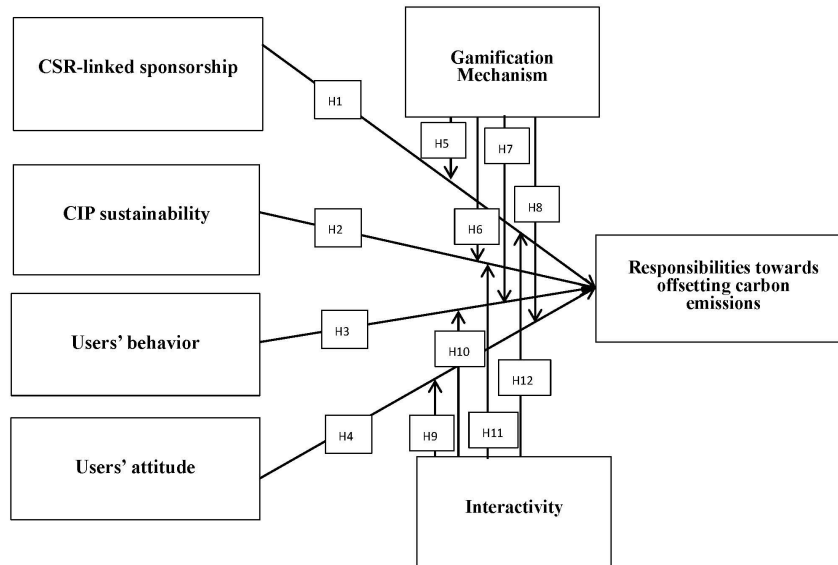


Figure 3: Proposed Conceptual Framework for Users' Sustainable Awareness Model

Conclusions

This study contributes to the understanding of how Ant Forest and similar Internet platforms can effectively promote sustainable behavior and engage users in environmental initiatives. The research identified key factors such as gamification mechanisms, interactivity, and psychological factors that influence users' attitudes and behaviors towards sustainable practices. By integrating theoretical frameworks and analyzing various aspects of Ant Forest, the study proposed a conceptual framework, the Users' Sustainable Awareness Model, which highlights the importance of CSR-linked sponsorship, users' behavior and attitude, and the role of gamification and interactivity as moderator variables.

The findings of this study have several implications. First, Chinese Internet platform companies can enhance users' attitudes and behaviors towards sustainability by incorporating gamification, interactivity, and CSR-linked sponsorship into their platforms. Second, factors such as awareness dimensions, social norms, identities, motivations, contextual factors, perceived consumer control effectiveness, ethical ideologies, online immersion, global cooperation intention, and digital technology play a crucial role in maintaining users' sustainable behavior. Recognizing and leveraging these factors can

contribute to the long-term success of Internet platforms in promoting sustainable practices.

However, this study also has some limitations. Firstly, the research relied on a desktop survey, which may not capture the full range of users' experiences and perspectives. Future studies could employ more diverse and in-depth research methods, such as interviews and user observations, to gain a comprehensive understanding of users' behaviors and motivations. Secondly, the study focused specifically on Ant Forest and Chinese Internet platform companies, which may limit the generalizability of the findings to other contexts and platforms. Further research could explore the applicability of the Users' Sustainable Awareness Model in different cultural and geographical settings.

Based on the findings and limitations of this study, several suggestions for future research emerge. Firstly, empirical studies can be conducted to evaluate the effectiveness of the Users' Sustainable Awareness Model in promoting sustainable behavior among users. This could involve longitudinal studies tracking users' attitudes and behaviors over an extended period. Secondly, further research can explore the role of personalized feedback and recommendations in fostering sustainable behavior on Internet platforms. Understanding how tailored interventions can motivate users

and sustain their engagement would provide valuable insights for platform design and management. Additionally, comparative studies can be conducted to investigate the differences in users' sustainable behavior and attitudes across different Internet platforms.

In conclusion, this study highlights the potential of Ant Forest and similar Internet platforms to improve users' self-awareness about sustainability and promote sustainable behavior. The proposed Users' Sustainable Awareness Model provides a conceptual framework for understanding and fostering sustainable practices on Internet platforms. However, further research is needed to validate and refine the model, explore its applicability in diverse contexts, and investigate additional factors that influence users' sustainable behavior. By addressing these areas, future research can contribute to the development of effective strategies for promoting sustainability through Internet platforms.

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References

- Alzaidi, S. M. and Iyanna, S. (2021) 'Developing a conceptual model for voluntary pro-environmental behavior of employees', *Social Responsibility Journal*, 18(2), pp. 441–452.
- Ashfaq, M., Tandon, A., Zhang, Q., Jabeen, F. and Dhir, A. (2023) 'Doing good for society! How purchasing green technology stimulates consumers toward green behavior: A structural equation modeling–artificial neural network approach', *Business Strategy and the Environment. Business Strategy and the Environment* 32, 4, pp. 1274–91.
- Ashfaq, M., Zhang, Q., Zafar, A. U., Malik, M. and Waheed, A. (2021) 'Understanding Ant Forest continuance: Effects of user experience, personal attributes, and motivational factors', *Industrial Management & Data Systems*, 122(2), pp. 471–498.
- Berger, M., Lange, T. and Stahl, B. (2022) 'A digital push with real impact – Mapping effective digital nudging elements to contexts to promote environmentally sustainable behavior', *Journal of Cleaner Production*, 380 <https://doi.org/10.1002/bse.3188>.
- Bhuiyan, M. A. H., Darda, M. A. and Hossain, M. B. (2022) 'Corporate social responsibility (CSR) practices in Islamic banks of Bangladesh', *Social Responsibility Journal*, 18(5), pp. 968–983.
- Brick, C., Sherman, D. K. and Kim, H. S. (2017) "“Green to be seen” and “brown to keep down”: Visibility moderates the effect of identity on pro-environmental behavior', *Journal of Environmental Psychology*, 51, pp. 226–238.
- Bruckermann, C. (2022) 'There's an App for That!': Ordering Claims on Natural Resources through Individual Carbon Accounts in China', *Capitalism, Nature, Socialism*, 33(4), pp. 95–114.
- CAICT (2022) 'White Paper on Global Digital Economy (2022)', Available at: http://www.caict.ac.cn/english/research/whitepapers/202303/t20230316_416850.html (Accessed: December 2022).
- Cao, Y., Kou, F., Hu, H. and Wan, G. (2022) 'How gamified cooperation and competition motivate low-carbon actions: An investigation of gamification in a popular online payment platform in China', *Journal of Environmental Management*, 324, 116259.
- Chang, M.-Y., Kuo, H.-Y. and Chen, H.-S. (2022) 'Perception of Climate Change and Pro-Environmental Behavioral Intentions of Forest Recreation Area Users—A Case of Taiwan', *Forests*, 13(9).
- Chen, B., Feng, Y., Sun, J. and Yan, J. (2020) 'Motivation Analysis of Online

- Green Users: Evidence From Chinese "Ant Forest.", *Frontiers in Psychology*, 11.
- Chen, Y. and Cai, D. (2019) 'Ant Forest through the Haze: A Case Study of Gamified Participatory Pro-Environmental Communication in China', *J*, 2(4), Article 4. Available at: <https://doi.org/10.3390/j2040030> (Accessed: June 2023). Chi, M., George, J. F., Huang, R. and Wang, P. (2020) 'Unraveling sustainable behaviors in the sharing economy: An empirical study of bicycle-sharing in China', *Journal of Cleaner Production*, 260, pp. 120962.
 - Cropanzano, R. (2009) 'Writing Nonempirical Articles for Journal of Management: General Thoughts and Suggestions', *Journal of Management*, 35(6), pp. 1304-1311.
 - Demirel, A. (2020) 'CSR in sport sponsorship consumers' perceptions of a sponsoring brand's CSR', *International Journal of Sports Marketing and Sponsorship*, 21(2), pp. 371-388.
 - Feng, Z.-Y. and Tseng, Y.-J. (2019) 'Corporate social responsibility in the tourism industry: Evidence from seasoned equity offerings', *Current Issues in Tourism*, 22(1), pp. 91-106.
 - Freeman, R. E. (1984) Strategic management: A stakeholder perspective, Pitman.
 - Friedman, M. (1970) 'A Friedman doctrine: The social responsibility of business is to increase its profits', *The New York Times Magazine*, 13, pp. 32-33.
 - Hosta, M. and Zabkar, V. (2021) 'Antecedents of Environmentally and Socially Responsible Sustainable Consumer Behavior', *Journal of Business Ethics*, 171(2), pp. 273-293.
 - Huang, M., Mohamad Saleh, M. S. and Zolkepli, I. A. (2023) 'The Moderating Effect of Green Advertising on the Relationship between Gamification and Sustainable Consumption Behavior: A Case Study of the Ant Forest Social Media App', *Sustainability (Switzerland)*, 15(4).
 - Ibrahim, R. (2020) Thinking Tools: Navigating a Three-year Phd Journey, Partridge Singapore.
 - Ibrahim, R. and Mustafa Kamal, R. (2018) Templates for Thinking, Unpublished Literary. Copyright MYIPO LY2018002437.
 - Kamal, Y. (2021) 'Stakeholders' expectations for CSR-related corporate governance disclosure: Evidence from a developing country', *Asian Review of Accounting*, 29(2), pp. 97-127.
 - Kesavan, R., Bernacchi, M. D. and Mascarenhas, O. A. J. (2013) Word of Mouse: CSR Communication and the Social Media, 9(1).
 - Li, M., Liu, F. & Abdullah, Z. (2024) 'Analysis of online CSR message authenticity on consumer purchase intention in social media on Internet platform via PSO-1DCNN algorithm'. *Neural Comput & Applic* 36, 2289-2302.
 - Martínez García de Leaniz, P., Herrero Crespo, Á. and Gómez-López, R. (2019) 'The role of environmental CSR practices on the formation of behavioral intentions in a certified hotel context: Exploring the moderating effect of customer involvement in the buying process', *Spanish Journal of Marketing - ESIC*, 23(2), pp. 205-226.
 - Mi, L., Xu, T., Sun, Y., Zhao, J., Lv, T., Gan, X., Shang, K. and Qiao, L. (2021) 'Playing Ant Forest to promote online green behavior: A new perspective on uses and gratifications', *Journal of Environmental Management*, 278, 111544.
 - Robertson, J. L. and Barling, J. (2015a) 'Introduction', in Robertson, J. L. and Barling, J. (Eds.), *The psychology of green organizations*, pp. 3-11, New York, NY: Oxford University Press.
 - Saifulina, N., Carballo-Penela, A. and Ruzo-Sanmartín, E. (2022) 'Effects of personal environmental awareness and environmental concern on employees' voluntary pro-environmental behavior: A mediation analysis in emerging countries', *Baltic Journal of Management*, 18(1), pp. 1-18.
 - Sullivan, V. S., Smeltzer, M. E., Cox, G. R. and MacKenzie-Shalders, K. L. (2021) 'Consumer expectation and responses to environmental sustainability initiatives and their impact in foodservice operations: A systematic review', *Journal of Human Nutrition and Dietetics*, 34(6), pp. 994-1013.
 - Tingchi Liu, M., Anthony Wong, I., Shi, G., Chu, R. and Brock, J. (2014) 'The impact of corporate social responsibility (CSR) performance and perceived brand quality on customer-

- based brand preference', *Journal of Services Marketing*, 28(3), pp. 181–194.
- Wang, S., Ibrahim, M. H. and Li, M. (2022) 'Motivations Influencing Alipay Users to Participate in the Ant Forest Campaign: An Empirical Study', *International Journal of Environmental Research and Public Health*, 19(24), Article 24.
 - Wang, X. and Yao, X. (2020) 'Fueling Pro-Environmental Behaviors with Gamification Design: Identifying Key Elements in Ant Forest with the Kano Model', *Sustainability*, 12(6), Article 6.
 - White, K., Habib, R. and Hardisty, D. J. (2019) 'How to SHIFT consumer behaviors to be more sustainable: A literature review and guiding framework', *Journal of Marketing*, 83(3), pp. 22–49.
 - Wolff, A., Gondran, N. and Brodhag, C. (2018) 'Integrating corporate social responsibility into conservation policy. The example of business commitments to contribute to the French National Biodiversity Strategy', *Environmental Science & Policy*, 86, pp. 106–114.
 - Xiong, N., Ren, P., Sun, B., He, S., Jiang, L. and Cui, H. (2022) 'Influence of incentive mechanism and fit degree on user's environmental behavior—Taking Alipay "Ant Forest" in China as an example', *Frontiers in Psychology*, 13.
 - Yang, Z., Kong, X., Sun, J. and Zhang, Y. (2018) 'Switching to Green Lifestyles: Behavior Change of Ant Forest Users', *International Journal of Environmental Research and Public Health*, 15(9), pp. 1819.
 - Zacher, H., Rudolph, C. W. and Katz, I. M. (2023) 'Employee Green Behavior as the Core of Environmentally Sustainable Organizations', *Annual Review of Organizational Psychology and Organizational Behavior*, 10, pp. 465–494.
 - Zhang, B., Hu, X. and Gu, M. (2022) 'Promote pro-environmental behaviour through social media: An empirical study based on Ant Forest', *Environmental Science & Policy*, 137, pp. 216–227.
 - Zhang, Y., Chen, J., Han, Y., Qian, M., Guo, X., Chen, R., Xu, D. and Chen, Y. (2021) 'The contribution of Fintech to sustainable development in the digital age: Ant forest and land restoration in China', *Land Use Policy*, 103, 105306.
 - Zhang, Y., Xiao, S. and Zhou, G. (2020) 'User continuance of a green behavior mobile application in China: An empirical study of Ant Forest', *Journal of Cleaner Production*, 242, 118497.
 - Zhou, F., Mou, J. and Kim, J. (2021) 'Toward a meaningful experience: An explanation of the drivers of the continued usage of gamified mobile app services', *Online Information Review*, 46(2), pp. 285–303.