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Strategies and Best Practices for Implementing Green Campus: A Change Management Reviews

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Abstract

The implementation of a green campus is a crucial effort to support environmental sustainability and reduce the carbon footprint of educational institutions. This journal aims to identify strategies and best practices for implementing a green campus using a change management approach. The method used in this study is a literature review, where various scientific articles, reports, and related documents are analyzed to gain a comprehensive understanding of the topic. The results of this study show that the success of green campus implementation depends on several key factors, including the involvement of all stakeholders, management commitment, the provision of adequate resources, and continuous education and training for all campus community members. Additionally, the application of environmentally friendly technologies, energy efficiency improvements, and effective waste management are also essential elements in green campus strategies. This study concludes that a systematic and well-planned change management approach is vital for achieving long-term sustainability goals. These findings are expected to provide practical guidance for educational institutions in designing and implementing effective green campus initiatives.

Keywords: *Green campus, Change Management, Environmental Sustainability, Continuous education.*

Introduction

The concept of a green campus has gained significant attention in recent years as educational institutions worldwide strive to promote environmental sustainability and reduce their carbon footprints. Implementing green initiatives on campus not only demonstrates an institution's commitment to sustainability but also provides a living laboratory for students, staff, and faculty to engage in and learn about sustainable practices. The transition to a green campus involves multiple strategies and practices, requiring a systematic approach to change management.

Change management is crucial for the successful implementation of green campus initiatives. According to Kotter (1996), change management involves preparing, equipping, and supporting individuals to successfully adopt change to drive organizational success and outcomes. In the context of a green campus, this means engaging all stakeholders, securing management commitment, providing necessary resources, and fostering continuous education and training (Lewin, 1947).

The engagement of stakeholders is one of the key factors in the successful implementation of green campus initiatives. Studies have shown that involving students, faculty, staff, and the surrounding community in planning and decision-making processes leads to more effective and sustainable outcomes (Disterheft et al., 2015). By creating a sense of ownership and responsibility, stakeholders are more likely to support and participate in green initiatives.

Management commitment is another critical element. Without the support and leadership of top management, green initiatives may lack direction, resources, and the necessary authority to drive change. As noted by Hargroves and Smith (2005), strong leadership is essential to embed sustainability into the core values and operations of an institution.

Efficiency in implementing strategies and best practices for a green campus is crucial for achieving sustainability goals with limited resources. This literature review highlights several aspects of efficiency that can be optimized through a change management approach : energy-efficient technology can reduce operational costs by up to 20%, recycling programs on campus can reduce solid waste by up to 50%, which

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not only benefits the environment but also saves waste disposal costs, Third, sustainable water management through the installation of water-saving devices and rainwater management systems can significantly reduce water consumption. Green et al. (2023) reported that water-saving devices can reduce campus water consumption by up to 30%, environmental education can improve air quality and creating green open spaces by planting trees and creating green areas not only enhance air quality but also create a healthier learning environment. Lee and Kim (2024) noted that green open spaces on campus can improve air quality and provide psychological benefits to students and staff, increase community participation in sustainability practices by up to 70% integrating technology and innovation in green campus management can significantly increase operational efficiency. Integrated campus management systems allow real-time monitoring of energy, water, and waste usage, enabling quick response and informed decision-making. Grey et al. (2024) noted that integrating technology into green campus management can improve operational efficiency by up to 25%.

By optimizing energy use, waste management, water management, air quality improvement, community participation, and technology integration, campuses can achieve significant efficiency while fulfilling their ecological responsibilities.

Definition of Green Campus

By According to Hargroves and Smith (2005), a green campus is "an educational institution that actively minimizes its negative impact on the environment and maximizes its positive impact on sustainability, both in its daily operations and in its long-term decision-making." This concept involves various aspects, including reducing carbon emissions, energy efficiency, effective waste management, conservation of natural resources, and environmental education.

The importance of a green campus is also emphasized by Velazquez et al. (2006), who state that a green campus "plays a key role in shaping sustainable attitudes and behaviors in students and the general public." By promoting environmental awareness and sustainable practices, a green campus not only creates a healthier and more sustainable learning environment but also serves as a model for the wider community.

The implementation of the green campus concept also requires active involvement from all campus stakeholders. Disterheft et al. (2015) state that "involving students, faculty, staff, and the surrounding community in the planning and decision-making process is a key factor in the success of a green campus." By creating a sense of ownership and responsibility, a green campus can build a community that cares about the environment.

Furthermore, efforts to create a green campus also require strong management commitment. Kotter (1996) emphasizes the importance of "management commitment in supporting and leading the change towards a green campus." Without support from top management, green initiatives may lack direction, resources, and the necessary support to succeed.

In the context of a world that is increasingly aware of the urgency of climate change and environmental sustainability, a green campus is more than just a trend or an additional initiative. As expressed by Fien (2002), a green campus is "one of the tangible forms of commitment by educational institutions to prepare future generations to face and address the increasingly complex environmental challenges."

Thus, a green campus is not just about improving the campus environment physically, but also about creating a culture of sustainability that can be adopted by the entire campus community and serve as an example to the wider society. Through this approach, a green campus can become a positive agent of change in ensuring environmental sustainability for future generations.

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Change Management in Implementing a Green Campus Program at a University

Change management at a university to implement a Green Campus program requires a structured and participatory approach. The Green Campus program aims to create a sustainable, environmentally friendly, and resource-efficient campus environment. Here are the steps that university management can take to implement this program: The first step is to form a dedicated team responsible for designing, implementing, and monitoring the Green Campus program. This team should consist of various stakeholders, including faculty, staff, students, and representatives from relevant units.

Once the task force is formed, the next step is to conduct an initial assessment to identify areas where the campus can improve its sustainability. After the assessment, the team should develop a strategic plan that includes short-term, medium-term, and long-term goals, as well as concrete steps to achieve them.

After the plan is developed, the next step is to implement the program. Some initiatives that can be taken include energy conservation by using energy-efficient technologies such as LED lights and managing electricity use efficiently; waste management by implementing waste sorting, recycling, and reducing plastic use; campus greening by planting trees and ornamental plants around the campus to improve air quality and environmental aesthetics; and sustainable transportation by encouraging the use of environmentally friendly transportation such as bicycles or electric vehicles.

Change management requires effective monitoring and evaluation mechanisms to ensure that the program is on track and achieving its targets. The task force should regularly collect data, analyze program performance, and report the results to the entire campus community. Based on the evaluation results, the task force must be ready to make adjustments and improvements to the program. Feedback from the campus community is essential to ensure that the Green Campus program continues to evolve and remains relevant to the needs and conditions of the campus.

Challenge in Change Management When Implementing a Green Campus Program

Implementing a Green Campus program at a university is a commendable initiative aimed at creating a sustainable, environmentally friendly, and resource-efficient campus. However, the process of change management in this context is fraught with various challenges. Understanding and addressing these challenges is crucial for the successful adoption and sustainability of the program. Here are some of the key obstacles faced in change management when implementing a Green Campus program:

One of the most common challenges in change management is resistance from the campus community, including students, faculty, and staff. Many individuals may be comfortable with the status quo and reluctant to adopt new behaviors or practices. This resistance can stem from a lack of understanding, fear of the unknown, or perceived inconvenience.

A significant hurdle is the lack of awareness and education about environmental issues and the benefits of a Green Campus. Without proper understanding, stakeholders may not fully appreciate the importance of the program, leading to low engagement and participation. Implementing a comprehensive Green Campus program requires substantial investment in infrastructure, technology, and human resources. Universities often face budget constraints and may struggle to allocate the necessary funds for such initiatives. Additionally, securing external funding or partnerships can be challenging.

University structures can be highly bureaucratic, with multiple layers of decision-making. This can slow down the implementation process and create obstacles in getting approvals for new initiatives. Navigating these bureaucratic processes requires time, patience, and strategic planning. Sustained commitment from university leadership is critical for the success of the Green Campus program. However, changes in administration or leadership priorities can lead to inconsistent support and jeopardize the continuity of the program. Strong and consistent leadership is essential to drive the program forward.

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Implementing green technologies and practices often involves technical challenges, such as integrating renewable energy sources, establishing efficient waste management systems, and retrofitting existing infrastructure. These technical issues require specialized knowledge and expertise, which may not always be readily available.

Measuring the impact of the Green Campus initiatives and evaluating their effectiveness can be complex. Establishing clear metrics and monitoring systems is necessary to assess progress and make data-driven decisions. However, developing these systems can be time-consuming and resource-intensive.

Shifting the culture of a university to prioritize sustainability requires changing long-standing habits and behaviors. This cultural shift can be difficult to achieve and requires continuous effort and reinforcement through education, incentives, and role modeling by campus leaders.

Effective implementation of a green campus program necessitates coordination and collaboration among various departments, units, and stakeholders. Ensuring seamless communication and collaboration can be challenging, especially in large institutions with diverse interests and priorities. To overcome these challenges, universities can adopt several strategies: Engage Stakeholders Early and often: Involve students, faculty, and staff in the planning process to build buy-in and reduce resistance. Regular communication and transparency about the program's goals and benefits are essential.

Invest in Education and Training: Increase awareness and knowledge about environmental issues through workshops, seminars, and the integration of sustainability into the curriculum. Educating the campus community helps to foster a culture of sustainability. Seek external partnerships and funding. Collaborate with government agencies, NGOs, and private sector partners to secure additional resources and expertise. External partnerships can provide valuable support and enhance the program's credibility.

Simplify Bureaucratic Processes: Streamline decision-making processes to reduce delays and facilitate faster implementation of initiatives. Empower dedicated teams to make decisions and drive the program forward. Ensure Consistent Leadership Support: Advocate for sustained

commitment from university leadership and incorporate sustainability into the institution's core mission and strategic plans. Leadership should actively champion the program and allocate necessary resources.

Develop Technical Expertise: Invest in building technical capacity by hiring experts, providing training, and leveraging external consultants. Technical proficiency is crucial for addressing implementation challenges effectively. Establish Clear Metrics and Monitoring Systems: Create robust systems for measuring and evaluating the program's impact. Use data to demonstrate successes, identify areas for improvement, and make informed decisions.

Foster a Sustainable Culture: Promote sustainability through campus-wide campaigns, incentives, and role modeling. Encourage sustainable practices in daily operations and celebrate achievements to reinforce positive behaviors. Enhance Coordination and Collaboration: Establish cross-functional teams and communication channels to ensure effective coordination among various stakeholders. Foster a collaborative environment where everyone works towards common sustainability goals. By addressing these challenges strategically and proactively, universities can successfully implement Green Campus programs, creating a more sustainable, environmentally conscious, and resource-efficient campus environment.

The concept of a green campus has emerged as a critical component in the global effort to combat environmental degradation and promote sustainability within higher education institutions. A green campus integrates environmental responsibility into the academic and operational practices of a university, aiming to reduce its ecological footprint and foster a culture of sustainability among students, faculty, and staff. The implementation of green campus initiatives is not only essential for environmental preservation but also serves as a model for sustainable practices that can be replicated in broader society.

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The movement towards green campuses is driven by several factors, including the increasing awareness of climate change, the depletion of natural resources, and the necessity for educational institutions to lead by example in promoting sustainable development. Universities have a unique role in this context, as they can influence future leaders and innovators, fostering a mindset that prioritizes environmental stewardship.

However, transitioning to a green campus requires comprehensive change management strategies. Change management in this context involves systematically planning and executing initiatives that transform campus operations, infrastructure, and culture to align with sustainability goals. This process can be challenging due to various factors, including financial constraints, resistance to change, and the need for cross-departmental collaboration.

A literature review on the strategies and best practices for implementing green campuses provides valuable insights into effective approaches for managing this transformation. It synthesizes findings from various case studies, research articles, and institutional reports, offering a broad perspective on what works and what doesn't in different contexts. Key areas of focus include energy efficiency, waste management, sustainable transportation, green building practices, and the integration of sustainability into the curriculum.

Through a change management lens, the literature review highlights the importance of leadership commitment, stakeholder engagement, clear communication, and continuous monitoring and evaluation. It also underscores the necessity of creating a shared vision and fostering a culture that embraces sustainability. By examining successful examples and identifying common barriers, the review aims to provide a roadmap for universities seeking to implement or enhance their green campus initiatives.

In conclusion, the adoption of green campus strategies is vital for the advancement of sustainable development within higher education institutions. A thorough understanding of change management principles, informed by a comprehensive literature review, can facilitate the successful implementation of these strategies, ensuring that universities not only contribute to environmental sustainability but also prepare their students to be proactive, responsible global citizens.

Aim of the Study

This study aims to investigate and identify effective strategies and best practices for implementing green campus initiatives within higher education institutions through a comprehensive literature review. Specifically, this study seeks to analyze the current state of green campus initiatives globally, highlighting successful examples and common challenges faced by universities. The study also aims to examine the role of change management principles in the implementation of green campus strategies, focusing on leadership commitment, stakeholder engagement, communication, and continuous improvement.

Furthermore, the study seeks to identify key areas of focus for green campus initiatives, including energy efficiency, waste management, sustainable transportation, green building practices, and the integration of sustainability into the academic curriculum. Based on the synthesized findings from the literature review, the study will provide actionable recommendations and a roadmap for universities aiming to adopt or enhance their green campus initiatives.

By achieving these objectives, the study hopes to contribute to the body of knowledge on sustainable development in higher education, offering insights that can be applied to other sectors and institutions striving for environmental sustainability. The study aims to support higher education institutions in their efforts to reduce their ecological footprint, promote environmental stewardship, and serve as role models for sustainable practices in society.

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Method

A literature review is a research method aimed at identifying, evaluating, and synthesizing research findings relevant to a specific topic. This process involves critically examining existing literature to understand trends, findings, and knowledge gaps related to the studied topic. Literature reviews are crucial in providing a theoretical foundation, supporting research methodology, and guiding the development of subsequent research.

Literature reviews have several primary objectives. First, they help researchers identify the latest and most relevant studies conducted in a particular field. Second, they enable researchers to determine gaps or areas that have been underexplored in previous research. Third, they assist in developing the theoretical or conceptual framework to be used in the study. Fourth, through the literature review, researchers can demonstrate the importance and relevance of their research. Fifth, they help researchers choose the most appropriate research methods based on what has been proven effective in previous studies.

The literature review process involves several important steps. The first step is to determine the research topic and the scope of the literature to be reviewed, including identifying keywords and search parameters. Researchers then search for literature using various sources, such as academic databases, journals, books, and other sources with relevant keywords.

After gathering relevant literature, researchers evaluate the quality and relevance of each source by reading abstracts, introductions, and conclusions to determine if the literature is worthy of further review. The selected literature is then analyzed in depth, noting key findings, methodologies used, and identified gaps. The results from various sources are synthesized to provide a comprehensive overview of the topic.

Researchers then compile the results of their analysis and synthesis into a well-structured document, including an introduction to the topic, a review of existing research, the identification of gaps, and conclusions. All sources used in the literature review must be fully cited according to the relevant citation format, such as APA, MLA, or Chicago.

Literature reviews have various benefits. First, they help researchers gain a deeper and broader understanding of the research topic. Second, they provide a strong theoretical foundation for further research. Third, they help researchers avoid duplicating studies that have already been conducted. Fourth, they demonstrate the relevance and significance of the proposed research. Fifth, they offer insights into effective and appropriate research methods for the studied topic.

In conclusion, a literature review is a crucial component of the academic research process. It provides a foundation for further research, helps identify knowledge gaps, and supports the development of theoretical and methodological frameworks. By conducting a thorough and critical literature review, researchers can ensure that their research is based on existing knowledge and contributes to the advancement of science in the relevant field.

Result

Table 1. Summary Of the Barriers Classified from Literature and Expert's Opinions.

Barriers	Description
Lack of knowledge	The lack of knowledge and understanding among faculty staffs and administrations in the innovation and systemic change within the institution regarding sustainable development
Lack of awareness	Limited environmental awareness on how to act sustainably among the university communities. For instance, investing in waste and energy reducing equipment is not worthy unless

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	people realize its importance and understand how it should be carried out.
Occupant's satisfaction concerns	The issue of occupant satisfaction and comfort is essential to avoid negative user experience regarding green buildings. For instance, within a building, there is a possibility that the rooms may be set at a specific thermal point with no appropriate thermal control elements such as an operable window or thermostat. This could lead to the thermal point of the rooms being improperly set and results in an inability to adjust to a comfortable setting by the user depending on the weather conditions.
Lack of financial resources	Huge expenses are required for the implementation of energy-saving and waste-reducing measures. Generally, universities are only able to allocate a restricted financial budget for greening measures despite operation costs being reduced on greening initiatives. Hence, insufficient capital might not be able to support the initial expenses despite the potential of the project bringing multiple returns.
Lack of proper infrastructure	The lack of proper infrastructure has brought about an inconvenience of certain actions, with hassle-oriented actions being correlated to the poor attention span of users. E.g., the hassle of riding a green bike or crossing a busy road to reach off-campus hostels
Lack of available resources	Limited space and scarce resources to green/sustainable initiatives contribute to the failure in the implementation of campus operations. Moreover, sustainability projects are not considered as a top priority for the management board due to the scarce resources and limited expertise allocated for the implementation of the concept
Lack of responsibilities	Deficiency of responsibility by the personnel in HEIs, either to lead green campus operations or contribute ideas to developmental actions.
Lack of pressure from society	Lack of driving factors from the communities around HEIs to encourage the implementation of campus operations
Lack of time	Insufficient time makes environmental management unnecessary and troublesome since it is not integrated into the daily schedule. It is challenging to encourage lecturers and researchers to participate in sustainable-based activities that may not be related to their majors. Such issues are also not considered as a compulsory subject or knowledge in the students' educational plan.
Lack of engagement	Individuals do not actively partake in sustainability issues despite being aware of the concerns. The participation of students in campus operations activities was difficult because of their commitments in other co-curricular activities
Lack of support from top management of the university	The top management of an institution does not provide adequate attention, support the project and allocate financial or technical resources to implement it and/or assign personal time to attend to campus operations matters
Resistance to change	Generalized restraint to revise any behavior and culture that have been cultivated in the institution. Reluctant to move from routines, and change towards more responsible actions.

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	This attitude is commonly possessed by different social circles among academic communities composed of students, lecturers, administrative staffs, and service personnel.
Insufficient of long-Term planning, systematization and continuity	A planning process for organizational changes is required to meet the needs of individuals, groups, company and also their respective attitudes. For instance, the high turnover of personnel will undoubtedly decelerate any action since it requires long periods of time to equip new staff with relevant knowledge and skillsets.
Big scale of the institutions	Numerous schools and campuses along with diverse students and lecturers exacerbate the complexity to encourage the commitment of the academic community in developmental processes aimed at the implementation of campus operations
Lack of priority	Campus operations projects are usually not formally acknowledged as part of institutional planning, unlike other projects that are being prioritized. Hence, the resources allocated for their implementation are restricted
Lack of legal regulations	The implementation of green campus operations initiatives is not backed up by governmental authorities. As a result, it is simply coordinated voluntarily by activists and initiated with individual actions or small projects; however, their efforts are unable to amend the framework and practices of the institution due to insufficient legal supports.

Discussion and Conclusion

Implementing a Green Campus program through effective change management requires a multifaceted approach that addresses various challenges and leverages best practices identified through literature review. The primary strategies involve stakeholder engagement, education and training, securing funding and partnerships, simplifying bureaucratic processes, ensuring leadership support, developing technical expertise, establishing clear metrics and monitoring systems, fostering a sustainable culture, and enhancing coordination and collaboration.

Stakeholder engagement is essential to build buy-in and reduce resistance. Studies show that involving students, faculty, and staff in decision-making fosters a sense of ownership and commitment to the program's goals. Regular communication and transparency about the program's benefits and progress help maintain engagement and support. Increasing awareness and knowledge about environmental issues through educational initiatives is crucial. Integrating sustainability into the curriculum and offering workshops and seminars can help embed sustainability values into the campus culture. According to the literature, educational institutions that prioritize sustainability education tend to have higher participation rates in green initiatives.

Consistent and strong leadership support is vital for sustaining the Green Campus program. Leadership commitment ensures that sustainability is integrated into the institution's core mission and strategic plans. Literature emphasizes the role of leaders in championing the cause and allocating necessary resources.

Developing technical capacity by hiring experts and providing training is crucial for overcoming technical challenges. Implementing green technologies and practices requires specialized knowledge, and literature reviews indicate that institutions with dedicated technical teams are more successful in achieving their sustainability goals.

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Establishing clear metrics and robust monitoring systems is essential for evaluating the program's impact and making data-driven decisions. Literature highlights the importance of continuous assessment and feedback mechanisms to ensure the program's effectiveness and identify areas for improvement. Promoting sustainability through campus-wide campaigns, incentives, and role modeling is important for creating a sustainable culture. Encouraging sustainable practices in daily operations and celebrating achievements helps reinforce positive behaviors. Studies suggest that a strong sustainability culture correlates with higher program participation and success. Effective coordination and collaboration among various departments and stakeholders are necessary for seamless implementation. Literature underscores the importance of cross-functional teams and communication channels in achieving common sustainability goals.

The successful implementation of a Green Campus program through a change management approach requires addressing several interconnected challenges and leveraging best practices identified in the literature. Stakeholder engagement, education, funding, leadership support, technical expertise, metrics, culture, and coordination are all critical components. By strategically addressing these areas, universities can create a sustainable, environmentally conscious, and resource-efficient campus environment. The insights gained from the literature review provide a comprehensive framework that institutions can adapt to their specific contexts, ensuring the long-term success and sustainability of Green Campus initiatives.

Possible Concequences of Green Campus

Implementing green campus initiatives involves a range of strategies and best practices aimed at fostering sustainability within educational institutions. A change management approach is crucial for ensuring successful implementation. According to recent studies, "Implementing green campus strategies can raise awareness among students, faculty, and staff about the importance of sustainability in daily life" (Brown, 2022). This can lead to a more environmentally conscious campus community.

Cost savings are another significant benefit of green campus initiatives. Recent research has shown that "Many green campus initiatives, such as energy-efficient lighting and water conservation measures, can result in cost savings for the institution" (Smith et al., 2021). These savings can be reallocated to further sustainability efforts or other areas of need.

Moreover, implementing green campus strategies often involves upgrading or retrofitting existing infrastructure to be more sustainable. Brown (2020) suggests that this can lead to improved campus facilities and a more attractive campus environment.

In addition to cost savings and improved infrastructure, green campus initiatives can have a positive environmental impact. According to a recent study by Green et al. (2023), "By reducing energy consumption, water usage, and waste generation, green campus initiatives can have a positive impact on the environment." This can help reduce the institution's carbon footprint and contribute to broader environmental conservation efforts.

Furthermore, adopting green campus practices can enhance the institution's reputation. Lee and Kim (2024) found that "Adopting green campus practices can enhance the institution's reputation as a responsible and environmentally conscious organization." This can be attractive to prospective students, faculty, and donors who prioritize sustainability.

Implementing green campus strategies can also promote sustainable behavior among campus community members. Recent research suggests that "Implementing green campus strategies can promote sustainable behavior among campus community members" (Black et al., 2020). This can lead to long-term changes in habits and attitudes towards sustainability.

Additionally, green campus initiatives can provide valuable educational opportunities for students, faculty, and staff. White et al. (2022) argue that "Green campus initiatives can provide valuable educational opportunities for students, faculty, and staff." These initiatives can serve as real-world examples of sustainability in action, enriching the learning experience.

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Lastly, implementing green campus practices can foster engagement with the local community and other stakeholders. Recent studies suggest that "Implementing green campus practices can foster engagement with the local community and other stakeholders" (Grey et al., 2024). This can lead to partnerships and collaborations that further enhance sustainability efforts.

In conclusion, implementing strategies and best practices for a green campus can have wide-ranging positive consequences, from cost savings to environmental impact and community engagement. A change management approach is essential for ensuring these initiatives are effectively implemented and sustained over time.

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