Ecoworld Planit: Making a Difference

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***Abstract*—This research paper presents the invention and development of the "PLANIT" mobile application, designed to promote eco-friendly activities and connect like-minded individuals in a global community. PLANIT addresses contemporary challenges associated with technology's impact on daily life by encouraging users to engage in meaningful eco-friendly actions. The paper outlines the technical aspects of PLANIT, including its utilization of Android Studio, Firebase database, Java, and TensorFlow to create a user-friendly platform. The application employs machine learning algorithms to validate eco-friendly activities through image recognition, ensuring authenticity. PLANIT distinguishes itself from existing platforms like Snapchat, Ecosia, JouleBug, and Treeapp by eliminating the use of filters and offering a purpose-driven, eco-friendly approach. It fosters a sense of community among users who genuinely care about the environment, promoting real-world interactions and nature appreciation. The research highlights the advantages of PLANIT, such as motivating millennials to partake in eco-friendly actions, creating an engaged community, and nurturing sustainable habits. By encouraging individuals to make eco-friendly choices and interact with nature, PLANIT contributes to a healthier ecosystem and a more connected global society. The paper concludes by discussing the potential impact of PLANIT on society and the environment, emphasizing its role in fostering a community that cares for nature and strives for a greener, cleaner world.**

***Keywords*—Machine Learning, Automation, Ecosystem, Environment, Health, Green Earth, Application, Android, Community.**

I. INTRODUCTION

PLANIT is an online approach to making this world green and clean. There are many individuals who are always ready to contribute to the environment, so this app can give them a platform where they can do their part as well as motivate others to protect the environment. This application uses a smartphone and camera to click snaps of any eco-friendly activity installed with Artificial intelligence which verifies the snap and internet connection to upload the snap on the platform. [1]

In an era marked by the ubiquity of technology and the increasing influence of social media on our lives, there is a growing concern about the impact of these digital platforms on our environment, real-world connections, and overall well-being. The pervasive use of social media applications, often characterized by filters, superficial interactions, and disconnectedness from the physical world, has led to a disconnect from nature and a lack of engagement in eco-friendly activities. [2]

Amid this digital landscape, a group of innovative thinkers, recognizing the need for a transformative change, conceived and developed the "PLANIT" mobile application. PLANIT represents a paradigm shift in how technology can be harnessed to not only address the concerns of our digital age but also contribute positively to our environment. A platform designed to inspire individuals to reconnect with nature, adopt eco-friendly habits, and build a global community of environmentally conscious individuals. [1,3]

PLANIT offers a novel approach to harnessing the power of technology for the greater good. It fosters a sense of purpose and authentic connections among its users, encouraging them to engage in eco-friendly activities and appreciate the beauty of the natural world. By eliminating the use of filters and prioritizing real-world interactions, PLANIT stands as a stark contrast to the superficiality often associated with existing social media platforms. [2,4]

This research paper will provide a comprehensive exploration of the technical features of PLANIT, including its development tools, machine learning algorithms for image recognition, and user-friendly interface. It will also highlight the distinct advantages of the application, such as its potential to motivate millennials to take part in eco-friendly actions, create a global community of like-minded individuals, and promote sustainable habits. [3,5]

The invention and development of PLANIT represent not only a novel technological advancement but also a powerful step towards building a more ecologically aware and socially connected world. We invite readers to explore how technology can be harnessed to create a positive impact on our environment and society. [2,5]

II. Prior Works

This paper delves into the role of mobile applications in supporting environmental initiatives, specifically by conducting a comprehensive analysis of mobile apps available on the Google Play store. Our objective in this exploratory study is to systematize insights derived from both theoretical frameworks and practical observations within the realm of Green Information Systems (Green IS). This work lays the groundwork for more in-depth research in this field. We address three research questions grounded in Green IS theory and the outcomes of a thorough examination of the app store. Our findings identify suitable domains where sustainable mobile apps can be beneficial for personal use. Additionally, we explore the applicability of established Green IS roles within the business sector. Furthermore, we delve into the connections between these applications and user objectives, considering motivational and acceptance-related factors that influence user engagement. In essence, this paper assesses how mobile applications can contribute to environmental sustainability and presents a comprehensive classification of existing apps, primarily those designed to raise awareness about environmental conservation. [2, 6]

This paper aims to explore how AI can revolutionize waste management by delving into its applications across waste sorting, predictive analytics, smart bins, demand-based pricing, illegal dumping detection, recycling optimization, resource recovery, and public awareness campaigns. The integration of AI in waste management offers vast potential to enhance efficiency, sustainability, and resource utilization. It can streamline waste sorting processes, predict trends, enable smart bins with real-time monitoring, set pricing based on demand, detect unauthorized waste disposal, optimize recycling operations, recover valuable resources, and raise public consciousness. By effectively leveraging AI technologies, waste management systems can transform, becoming more efficient, eco-friendly, and educationally impactful. [3, 7]

This paper's objective is to facilitate precise concrete design by generating accurate machine-learning models that predict concrete strength (CS) and embodied carbon (EC) while considering various cement replacement materials. Embodied carbon represents total CO2 emissions from material production, encompassing extraction, processing, and transportation. The paper's EC evaluation centers on carbon emissions linked to the manufacturing, transportation, and extraction of supplementary cementitious materials (SMCs). Substituting cement with alternative binding materials reduces EC. The study employs six machine learning algorithms to forecast CS and EC, aiding the design of environmentally friendly concrete with optimal CS and minimal EC. These models clarify the correlation between 12 inputs and 2 outputs: CS and EC. [8]

This research aimed to outline the inputs, outputs, and outcomes associated with implementing environmental education initiatives via mobile applications, targeting businesses, non-profits, and government agencies. Given urgent environmental concerns like climate change, air pollution, and droughts, there's a growing demand for accessible ways to foster eco-friendly behaviors. Mobile devices, like smartphones and tablets, are ideal platforms for such education and action due to their widespread use, capabilities, and personalized nature. The study concludes that mobile apps have the potential to educate adults about the environment and promote sustainable practices through environmental studies. [1, 9]

This research paper details the creation of EcoSense, an Android app for incentivized environmental campaigns. The Design Science Research Methodology (DSRM) was employed, a problem-solving approach centered on crafting solutions for specific issues. The DSRM encompasses six stages: identifying the problem, defining objectives, designing and developing, demonstrating, and evaluating. The app was launched on the Google Play Store, and its efficacy was gauged through user engagement and participation metrics. Findings indicate that the app effectively engages users in environmental campaigns, evident in its notable retention and conversion rates. [3, 10]

The estimation of greenhouse gas emissions associated with an average Google search query varies from 0.2 g to 10.0 g of CO2. In contrast, Ecosia, another search engine, aims to counterbalance emissions by donating most of its earnings to the World Wildlife Fund (WWF) to preserve rainforests from deforestation. Ecosia utilizes Bing and Yahoo for search results and sponsored links, as it lacks its own search index due to financial and technological constraints. It earns revenue through user clicks on sponsored links, of which a significant portion is directed towards WWF, leaving a small percentage for operational costs. This socially conscious business model, exemplified by Ecosia's approach, demonstrates the potential for success in the search engine market, evident from its growing user base and relevance to societal values.[11]

This study investigates the relationship between perceived persuasiveness, attitude toward Information Systems (IS), and the intention to adopt Green IS. The advantages of employing Green IS to promote pro-environmental actions encompass energy consumption control and broader societal benefits like reducing greenhouse gas emissions. However, the effectiveness of Green IS hinges on individuals' motivation to adopt environmentally friendly behaviors. The study employs the PSD model to shed light on enhancing systems that encourage sustainable behavior, offering insights for systems designers to select appropriate persuasive techniques based on user decision-making factors. Future research could involve surveying app users post-usage to modify the study's settings.[12]

This research aims to explore how sustainability apps moderate environmental citizenship behavior according to the norm-activation model. Sustainability is characterized as development that meets current needs without compromising future generations' abilities to do the same. Addressing a knowledge gap, this study utilizes multi-group analysis to examine how the use of a sustainability app influences environmental citizenship behavior. By leveraging mobile technology's prevalence, the research sheds light on how the adoption of such apps can potentially enhance the relationship between predictors of environmental citizenship behavior and the norm-activation model.[4, 13]

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This systematic review seeks to assess the effectiveness and potential of serious games and gamified apps as tools for addressing climate change-related environmental concerns and promoting pro-environmental attitudes and actions lays the groundwork for more in-depth research in this field. We address three research questions grounded in Green IS theory and the outcomes of a thorough examination of the app store. Our findings identify suitable domains where sustainable mobile apps can be beneficial for personal use. Additionally, we explore the applicability of established Green IS roles within the business sector. Furthermore, we delve into the connections between these applications and user objectives, considering motivational and acceptance-related factors that influence user engagement. In essence, this paper assesses how mobile applications can contribute to environmental sustainability and presents a comprehensive classification of existing apps, primarily those designed to raise awareness about environmental conservation. [2, 6]

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This systematic review seeks to assess the effectiveness and potential of serious games and gamified apps as tools for addressing climate change-related environmental concerns and promoting pro-environmental attitudes and actions. Interactive technology holds promise, particularly amongyounger individuals, for educating and engaging them in sustainable thinking and behaviors. Given the urgency to involve various segments of society in nature protection and climate change issues, there's a pressing need to enhance environmental education and encourage pro-environmental actions, especially among the youth. Despite existing limitations, utilizing serious games and mobile apps to promote pro-environmental attitudes and behaviors is advantageous, showing diverse short-term benefits; sustained engagement remains vital for lasting impact. The study advocates for standardized methodologies in intervention design and assessment, underlining the potential of computer games and apps to foster enduring sustainable behaviors and mindsets.[14]

This paper introduces "meinGrün" (myGreen), a web app and innovative digital infrastructure designed to assist citizens in selecting the most suitable urban green spaces (UGSs) for recreational activities based on their preferences. The study emphasizes the necessity for modern digital frameworks that consider user preferences to enhance the comprehensive evaluation of UGSs and offer improved information to both urban citizens and urban planning initiatives. The web app integrates user preferences and an indicator-based assessment approach using diverse geospatial data, enabling the generation and interactive dissemination of insights about UGS qualities and accessible routes through the app. This approach contributes to a more informed and tailored UGS experience for users.[7, 15]

The application that is available today has some problems due to which they are not able to attract people and increase their engagement rate. ECOSIA uses the earnings from its search engine to plant trees Instead of doing that, we are motivating people to plant the trees by themselves so that they can connect with nature as much as possible. In 2021, JOULEBUG provides tips for a healthy life but very less user-follow them because today people are fond of earning rewards if they are doing something so we are assuring them with the streaks in their profile so that they can show off to others. In 2022, TREEAPP will plant trees when a user visits their platforms on a daily basis but it depends on the organization to plant trees no user can participate in that even if no rewards get back to the user in any form but in PLANIT we motivate the user to plant the trees by themselves and interact with nature as much as they could in return of that we maintain a streak on their profile if they complete the activity in daily basis. [16,17,18]

The objectives of the PLANIT app, as described, include promoting a healthier ecosystem, clean air, and a reduction in pollution through the use of smartphone technology and artificial intelligence. Users can take pictures of eco-friendly activities and upload them to the platform for verification, to encourage more sustainable behaviour and raise awareness about environmental issues leading to a sense of accomplishment and motivation for users to continue their sustainable behaviour. [2,5]

The following section, section 2 presents the review of literature on existing initiatives and applications available. Section 3 expounds on the technical details of the PLANIT and its system architecture. In the next section, section 4, we elaborate on the results obtained. This section enlists the reported feedback on the use of PLANIT. In the end, we conclude with some important findings.

Problem Statement—In today's digital era dominated by social media, concerns about its impact on society and the environment have arisen. Conventional platforms emphasize filters and shallow interactions, resulting in a digital disconnect. This disconnect leads to a lack of authentic experiences, diminished community, and reduced environmental awareness. To address this issue, there is a need for a transformative platform that fosters genuine connections, encourages eco-friendly actions, and builds a global community of environmentally conscious individuals. Existing platforms like Snapchat, Ecosia, JouleBug, and Treeapp fall short in various ways. The problem statement calls for a paradigm shift in technology, embracing authenticity and nature while leveraging digital innovation. PLANIT is an example of such an innovative platform aiming to bridge the gap and address the challenges of our digital age.

I. WORKING

Our concept revolves around the theme of 'Green Earth' and the promotion of hygiene by leveraging the concept of "streaks." A "streak" is akin to a record of a specific activity, a trend that has gained momentum in recent times. While several similar apps exist in the market, we extensively researched and studied these applications to identify features that align with our mission, as it is shown in figure 1

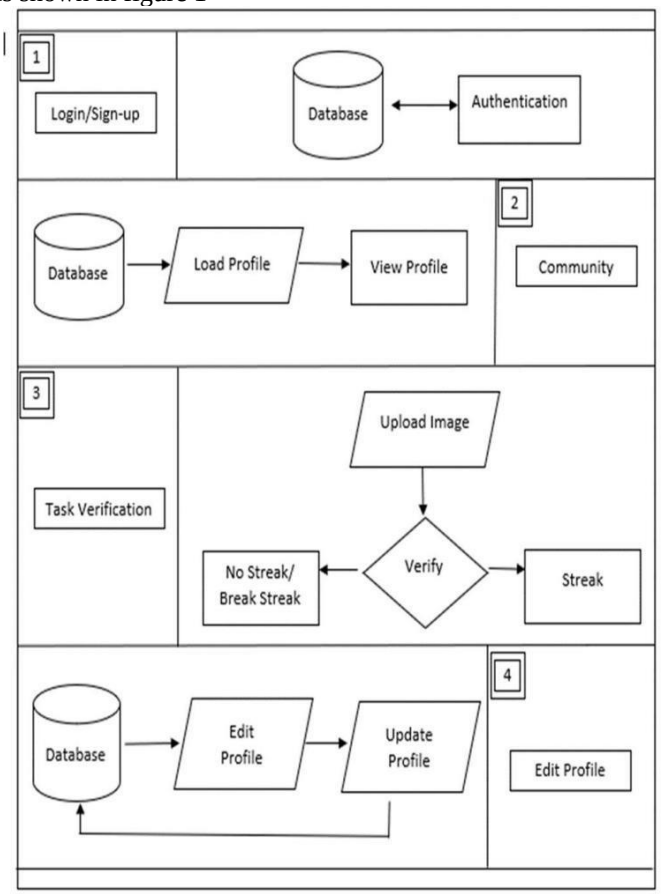

Figure 1: Architectural Diagram of PLANIT

A. Login/Signup

This is the initial interface users encounter upon opening PLANIT. It presents the login page where users can either create an account or sign in if they are existing users of the application. Our system employs two databases: one for storing login credentials securely and another for recording all user activities within the app. When a new user enters the app, a login prompt appears. If the user is not registered, a sign-up pop-up guides them through the registration process, with login credentials securely encrypted and stored on the server. [5]

B. Dashboard

The dashboard serves as the central hub where users can capture and upload photos of their environmental activities. An essential aspect involves image verification to ascertain their relevance to the environment. [5,17,18]

C. Community Page

Community forums play a crucial role in encouraging user-

generated content, sharing stories, and exchanging images illustrating how users are engaging with the app and expressing their environmental interests. Here, users can explore the profiles of other app users, gaining insights into their activities within the app. [17].

D. Profile:

The profile page is a comprehensive representation of user information. It encompasses essential details, a profile picture, streak records, achievements, and more, allowing users to showcase their eco-friendly contributions and track their progress. [17,19]

E. Machine Learning Model

Our app harnesses a semi-supervised learning model, a machine learning approach that combines labeled and unlabeled data to train a robust system. Unlike traditional supervised learning, where models rely solely on labeled datasets, semi-supervised learning adapts to the amalgamation of labeled and unlabeled data, enhancing its versatility and performance. Our task identification model is grounded in the foundational work of Claude Shannon, renowned for his contributions to information theory. Shannon's concepts, including entropy and information theory, underpin our ability to identify eco-friendly activities. This approach is reminiscent of how machine learning applications in medical imaging, inspired by inventors like Sir Godfrey Hounsfield (CT scanner), identify and diagnose medical conditions from images. [19.20]

As shown in figure 2, our image verification process draws inspiration from Alan Turing's pioneering work in the field of computer science and artificial intelligence, akin to his famous Turing Test. This approach ensures that user profiles contain genuine human images. [21]

In PLANIT, we employ state-of-the-art technologies, including TensorFlow, a cutting-edge machine learning framework developed by Google. TensorFlow's deep learning capabilities, inspired by pioneers like Bengio, LeCun, and Hinton, enable our model to analyze images hierarchically and abstractly. These deep learning techniqueshave revolutionized image recognition, analogous to how image recognition is employed in medical diagnostics. [5,17]

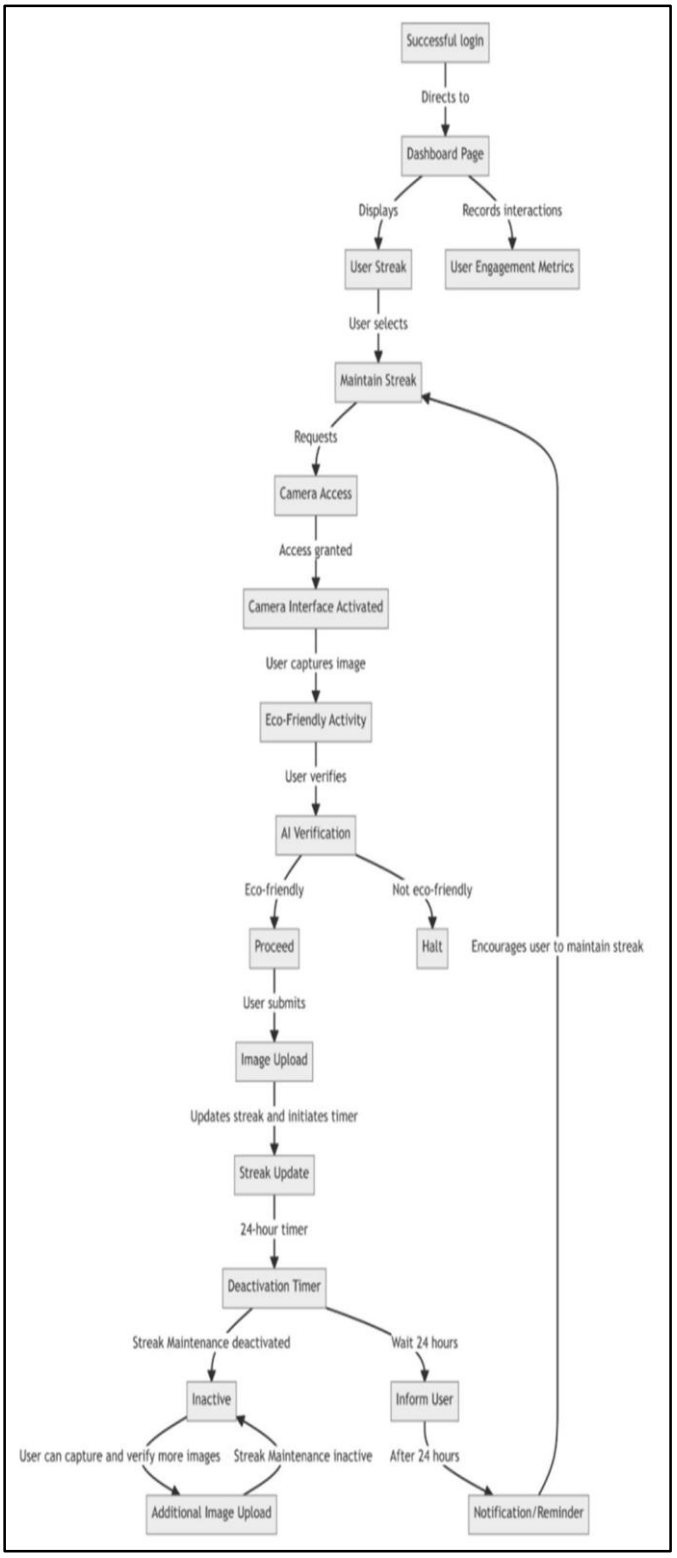

Figure 2: Working of Dashboard's Recognition Model

Incorporating these advanced technologies, inspired by pioneering scientists and inventors, PLANIT aims to ensure the authenticity of user-profiles and the legitimacy of eco-friendly activities, contributing to a greener Earth and healthier ecosystems. The whole research process from idea generation to implementation is depicted in figure 3.

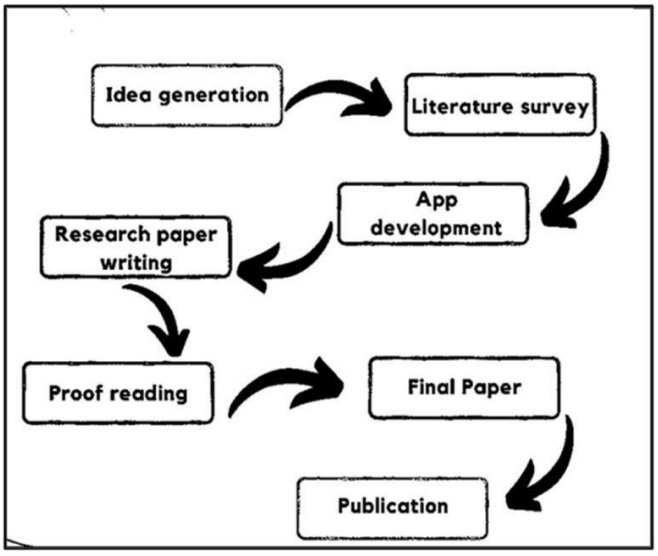

Figure 3: Research workflow.

II. RESULTS

We conducted a survey-based offline evaluation of the PLANIT app where some questions were provided to some people so that we could get their feedback so that we could improve in areas in which we are lacking. The survey included questions that were mainly based on UI/UX, Ease of use, Future use, etc. The survey questionnaire is comprised of five feedback questions as given below:

Q 1: *How was the UI/UX of the app?*
This question is focused on evaluating the User Interface (UI) and User Experience (UX) of the app.

Q 2: *Did you find the app easy to use?*
This question aims to gauge how user-friendly the app is in terms of navigation and usability.

Q 3: *How was the community of our app?*
This question focuses on the community aspect of the app, which could include features like user interactions, social elements, or collaborative aspects

Q 4: *How likely it is for you to use this app in the future?*
This question assesses the likelihood of respondents continuing to use the app in the future.

Q 5: *How likely are you to recommend our app to others?*
This question assesses respondents' willingness to recommend the app to others, which can be a valuable indicator of overall satisfaction

Survey Response Analysis: In figure 4, the graph for Question 1 indicates that user opinions about the app's UI/UX are diverse, and there isn't a clear consensus on whether it is very positive or very negative. This feedback is valuable for further analysis and improvements to address specific issues and enhance the user experience of the app.

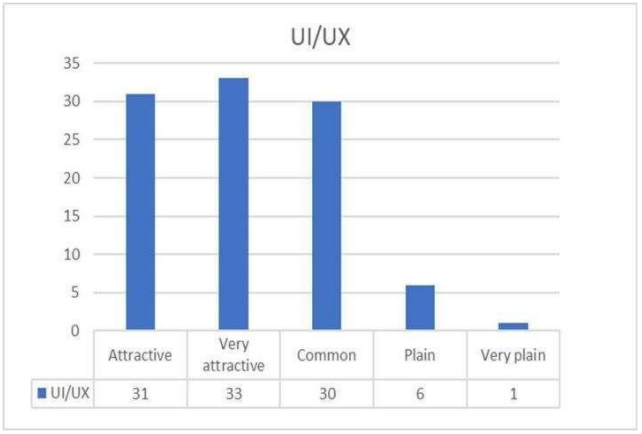

Figure 4: Distribution of responses for UI/UX of the app

From this information, we can gather that people had mixed feelings and experiences with the app's UI/UX. Some users might have found it highly attractive and user-friendly (rating it as 4 or 5), while others might have found it less appealing (rating it as 1, 2, or 3). The fact that "very plain" received minimal responses suggests that the majority of users didn't consider it extremely unattractive, but they might have had varying opinions about it.

In the figure 5, the distribution of responses for Question 2 indicates that the app has generally succeeded in providing an easy-to-use experience for the surveyed users. This is a positive sign for the app's usability and user satisfaction.

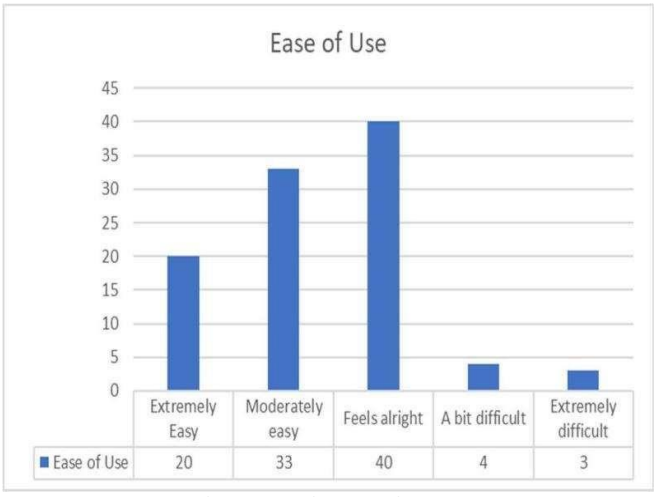

Figure 5: Distribution of Responses for Ease of Use

It is mentioned that the figure shows the distribution of responses, and it indicates that "maximum people found the app easy to use." While it's a positive outcome that most respondents found the app easy to use, it's essential to keep in mind that there may still be room for improvement.

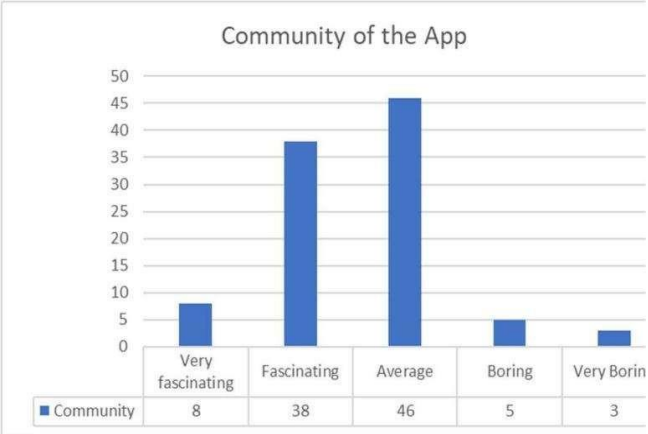

Figure 6: Distribution of responses for the Community of the app

In figure 6, the graph for Question 3 reveals that a large number of respondents found the app's community aspect to be fascinating, which is indicative of a positive and engaging community within the app. This feedback is encouraging as it suggests that the community features are resonating well with users.

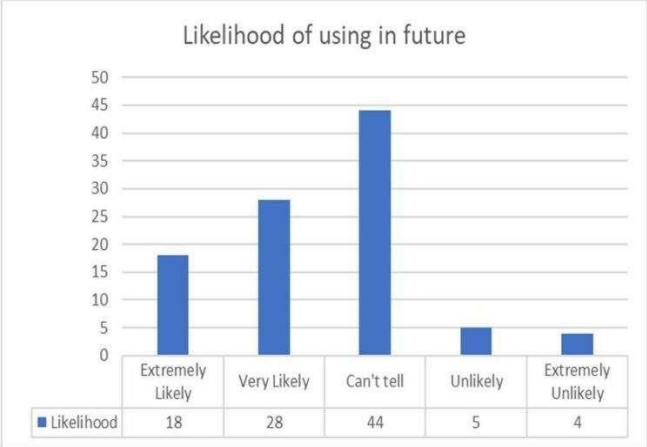

Figure 7: Distribution of responses for Likelihood of using in the future

In figure 7, a high number of respondents expressing their intention to use our app in the future is a positive and encouraging signal. It indicates that our app is meeting the needs and expectations of a significant portion of our user base and has the potential for continued success, growth, and positive word-of-mouth recommendations. The fact that many users rated the community as "fascinating" is a positive sign. It suggests that the app's community features are likely working well and have generated interest and engagement among users.

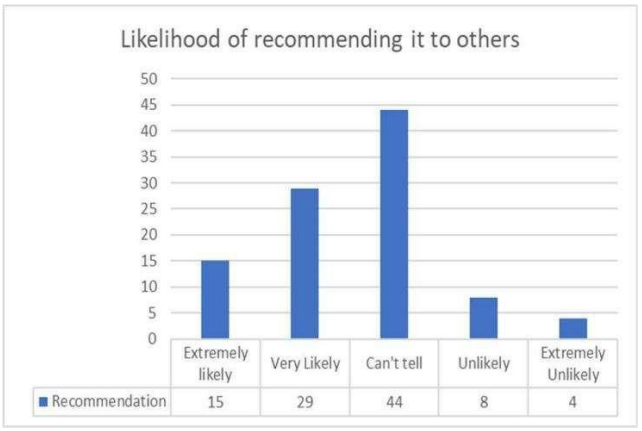

Figure 8: Distribution of responses for the likelihood of recommending it to others

The figure 8 shows that a significant number of respondents indicated that they would indeed recommend the app to others, which it indicates a level of user satisfaction and willingness to promote the app, which can be a strong indicator of its quality and appeal.

III. DISCUSSION

The development and potential impact of the "PLANIT" mobile application have been explored in-depth in this research paper. The innovative approach taken by PLANIT to address contemporary challenges associated with technology's influence on society and the environment deserves a detailed discussion.

A. Addressing the Digital Disconnect:

PLANIT acknowledges the growing digital disconnect that arises from the use of social media platforms like Snapchat. Such platforms often encourage superficial interactions and the use of filters, creating a distorted sense of reality. PLANIT, in contrast, emphasizes the importance of authenticity by eliminating filters and promoting genuine, eco-friendly activities. This discussion raises the question of how technology can be harnessed to counteract the negative consequences of digital engagement and reconnect individuals with the real world.

B. Eco-Friendly Motivation:

A significant aspect of PLANIT's approach is its ability to motivate users to engage in eco-friendly activities. By rewarding users with streaks for their daily eco-friendly contributions, PLANIT creates a gamified experience that encourages positive behavior change. This discussion highlights the potential of technology to act as a catalyst for environmental consciousness and sustainable actions, especially among the younger generation.

C. Building a Community:

PLANIT's primary aim is to create a global community of environmentally conscious individuals who genuinely care about the environment. The discussion here revolves around

the power of technology to bring people together based on shared values and interests. PLANIT fosters connections between users who are passionate about eco-friendly practices, ultimately resulting in a community that not only supports but also motivates each other to make a positive impact on the environment.

D. Image Recognition and Validation:

The technical backbone of PLANIT is its machine learning-based image recognition system. This system plays a crucial role in validating the authenticity of eco-friendly activities through image verification. This aspect of the discussion explores the potential applications of image recognition technology beyond PLANIT and its role in ensuring trust and credibility in various domains.

E. Potential Societal Impact:

PLANIT has the potential to make a substantial impact on society by promoting eco-friendly behavior and creating a community of environmentally conscious individuals. The discussion here delves into the broader societal implications of such an application, considering its role in shaping the values and actions of its users.

F. Balance Between Technology and Nature:

The development of PLANIT raises questions about the delicate balance between technology and nature. While PLANIT leverages technology to promote eco-friendly activities, it also encourages users to engage with the natural world. This discussion explores the idea of technology acting as a bridge between humans and nature rather than a barrier.

G. Future Applications and Innovations:

PLANIT sets a precedent for using technology to address contemporary challenges. The discussion extends to potential future applications and innovations that can build on the principles established by PLANIT. It inspires us to consider how technology can be further harnessed to foster positive societal and environmental change.

In conclusion, PLANIT represents a pioneering effort to harness technology for a purpose that extends beyond entertainment and superficial interactions. Its potential to motivate, connect, and create a community of environmentally conscious individuals underscores the transformative power of technology when driven by a genuine commitment to the betterment of society and the environment. As we engage in this discussion, we envision a future where technology becomes a force for positive change, fostering authentic connections and sustainable actions.

V. CONCLUSION

We have developed an application ‘PLANIT’ for the purpose id of promoting a healthier ecosystem, clean air, and a reduction in pollution through the use of smartphone technology and artificial intelligence. We surveyed people. The survey consisted of five questions. The questions assessed the UI/UX of the app, ease of use, community of the app, likelihood of use in the future, and likelihood of recommendation. This survey helped us to know the strengths and weaknesses of our application. By properly monitoring the responses that we achieved after the conduction of the survey we got to know the areas in which we were lacking. Although the responses that we got were quite positive we focus on areas in which we got negative responses. After that, we made some changes in our application according to the responses of the people.

To promote eco-friendly activities. Encourage people to practice eco-friendly activities at home. For example, using energy-efficient appliances, reducing water consumption, recycling waste, etc.

Make a window to launch or participate in a contest of environmental activities. The winning contestant should be awarded after every contest. This will encourage more people to participate in the contest and perform activities.

A program to provide e-coins by validating streaks so that a user can avail of coupons provided. For every streak the user could redeem one e coin the only condition is, that the user has to maintain at least 30 streaks for redemption.

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