iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 13 **Issue:** XI **Month of publication:** November 2025

DOI: https://doi.org/10.22214/ijraset.2025.75762

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 13 Issue XI Nov 2025- Available at www.ijraset.com

The Virtual Herbal Garden: A Digitally Immersive Solution for Medicinal Plant Education and Wellness Support

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Abstract: ***This paper is based on "The Virtual herbal Garden" a user-friendly web-based platform designed to digitally represents the diversity of medicinal plants, herbs, and flowers. Taking advantage of 3D modelling, high – resolution imagery, and interactive chats, the website delivers an engaging and informative user experience. A special highlight of this platform is its AI-powered chatbot, capable of providing herbal recommendations for various physical and psychological ailments. This aspect brings out the feature of the site, educational and wellness objective. In addition, the website has the capability of Google Translate API of support of many languages, extensive comprehensive plant database,growing strategies, and availability of informational materials.***

Keywords: Virtual Herbal Garden, herbal medicine, chatbot technology, Ayurveda, 3D interaction, artificial intelligence, Google Translate API, medicinal plants.

I. INTRODUCTION

During the last years, we witnessed a very effective rehabilitation of interest in traditional and herb medicine as an alternative or to artificial medicine. Owing to this attention, we have had emphasized points and relevance of older health system that we refer to as Ayurveda. Which is greatly relied on plant medicine for one's being.The Virtual Herbal Garden opens a way to that ancient heritage to the newly developed contemporary technology to offer a friendly platform for medicinal plant learning.

It allows people to explore an online library of blossoms and herbs abounding botanicalings, cultivation knowledge, therapeutic usage, and knowledge. Through the utilizations of interactive 3D models that are more understandable, images, chat support with the help of artificial intelligence. The platform facilitates the occurrence of intelligence, and multilingual access, a learning experience to the user, which is both educational and fun. Not only this model is an actor of you repository of knowledge but also a system which is actively perceptive and actual grasping of herbal medicine. The system of model urges to learn about the medicinal plants and their usage and assists your questions and specific scenario, helping to help user's better need. By doing this way, the Virtual Herbal Gardowns itself as educational tool and well backed system and mingles with ancient wisdom an effective novel digital invention.

II. LITERATURE REVIEW

Growing global inclination to natural and complementary medicine rekindled the interest about the enormous database of traditional herbal medicine. The abrupt eagerness, especially concerning systems that have been tried and were proved as Ayurveda did, created the necessity of tapping into valid information but there are great gaps between this new discovered curiosity and absence of professional, most convenient tools.The health organization of the world reacted to this apprehension in 2019 by noting that although it was more than 80 percent of the population in some regions of countries is dependent on the traditional herbal medicine for their primary healthcare, with fewer systematic, scientific, and convenient digital databases to make this information available. This is the overall issue that scientists have been trying on speech.

Early attempts to computerize the information were encouraging but demonstrated quite definite restrictions. For instance, a 2021 Kumar et al. developed an android-based mobile project application to sort out herbs but discovered that was not well not rich and scalable, the type of immersive, interactive experience which makes students unable to know and really understand the material. Their location was lacking immersionbased as 3D plant models or a chat-based interview schedule, which was limited by the extent of students could delve into the texts. Here is where new technologies come in, with their bringing and with them new and practical remedies to these former fines PRESENTATION is of great consequence to study botany--an awful lot. Sharma and Gupta carried out a research in the year.

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What they found in 2020, was that students remember 60% by memorization they get there better when they interact with 3D plant models instead better than receiving fixed 2D pictures or, in fact, by reading through a page description. That is why it is better to provide an experience, visual learning is not gimmickry at all, but that which is much better pedagogical device.

Chatbot technology has already been tried and tested its value in the medical sector. In 2022, a research established facts chatbot technology can be used as a potent tool in opposition to mental health counselling and dietetics advice. Its future prospects within the specific sector of Ayurvedic or herb medicine has, however, been underexploited. This opens a good potential idea of applying AI to provide individualized, locally acceptable, plant-based advice that is corroborated by specialists.

An internet health resource only serves to benefit if people are able to read it. Singh et al.'s 2022 research identified that language barrier can make health websites virtually useless to patients in rural or non-English speaking populations. This serves to emphasize the critical demand for multilingual support, such as the incorporation of the Google Translate API, to make this valuable information accessible to an international, diverse population.

III. OBJECTIVE

1) It can be used for educational tool for understanding theproperties and uses of medicinal plants.
2) You can see and interact with medicinal plants in a 3D virtual garden.
3) You can chat with an AI, and it will suggest herbal remedies.
4) Spreads awareness about the ayurvedic herbs which are useful in healing and safe for use in day to day life.

IV. METHODOLOGY

A. Frontend Development

The frontend of the website is built using help of HTML, CSS, Tailwind CSS, and Bootstrap.

These website adapte's accordingly to layout of the device. homepage features clickable images cards that display plant image, 3D models, and data about that plant ,Which helps in learning about the natural Herbs .

B. Backend and AI Framework

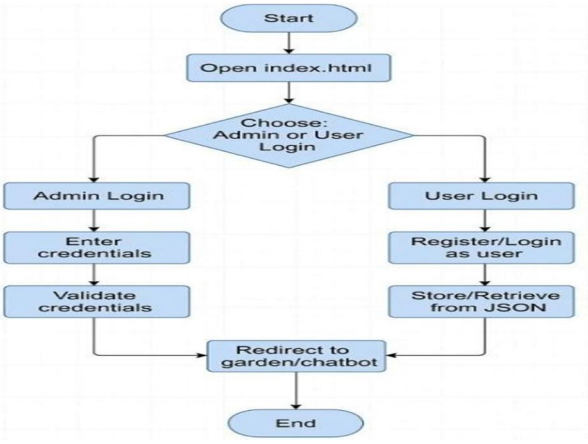
JavaScript was used to build the backend system, which also has a number of libraries to control chatbot and content display features. using Google AI Studio and the Gemini API, our AI-powered chatbot understands user queries and offers careful herbal recommendations based on each user's unique health needs.

C. Multilingual and Inclusive Design

All content is available in multiple languages due to the platform's integration of the Google Translate API, which serves a worldwide audience. Because of this feature, users with various languages can interact with the platform in meaningful ways.

D. Source Verification and Plant Data

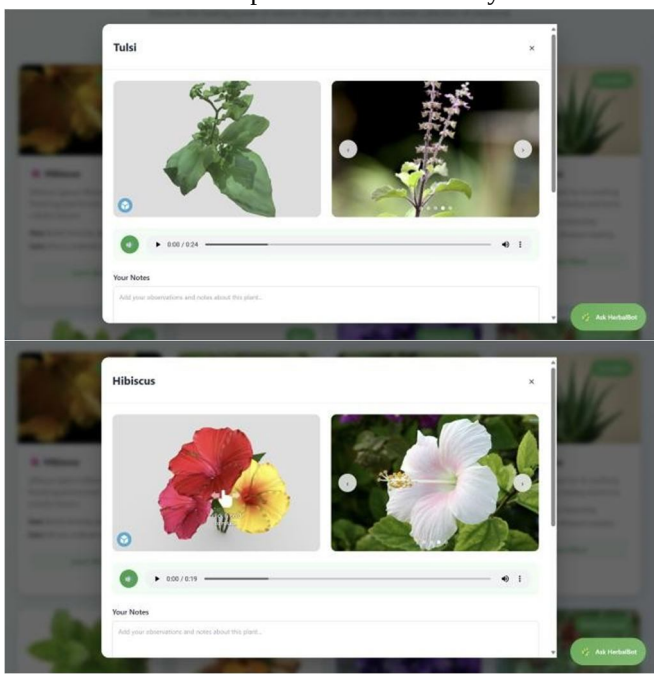
All information about the herbs comes from trusted Ayurvedic texts and is carefully checked by certified practitioners. Each plant profile shows its scientific name, what health benefits it has, how to use or prepare it, the recommended amount to take, and any warnings for people who might be sensitive.



V. KEY FEATURES

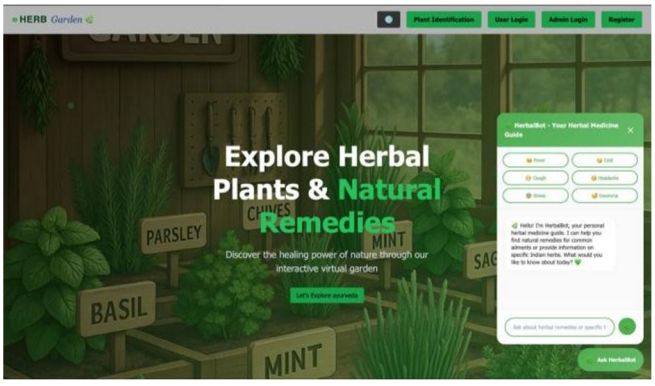
A. *Immersive 3D Plant Visualization and Exploration*

The website uses highly realistic 3D models as a means of allowing users to interactively explore an immensely wide range of medicinal plants. The users get the opportunity of viewing special botanical attributes like leaf structures, the structure of the flowers, as well as the root structures by rotating, zooming, as well as viewing the plants from special vantage points. This educational game serves the intention of elevating learning as well as enabling the right recognition of plants. Researchers, students, as well as hobbyists aiming to learn more about medicinal plants would extremely benefit from it.



B. *Intelligent, AI-Powered Conversational Assistant*

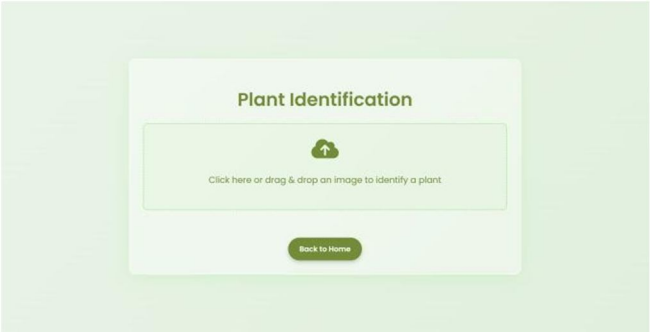
There is also an AI guide, almost like a friendly chatbot, that helps us find the right herbs for different health needs. If someone asks about a headache, cold, or digestion issues, the AI suggests safe herbs, how to use them, and even the right amount to take. It also shares safety tips so people don't misuse herbs. This makes herbal care easy to understand for beginners and useful for students or anyone curious about natural remedies.



C. *Comprehensive, Searchable Herbal Knowledge Repository*

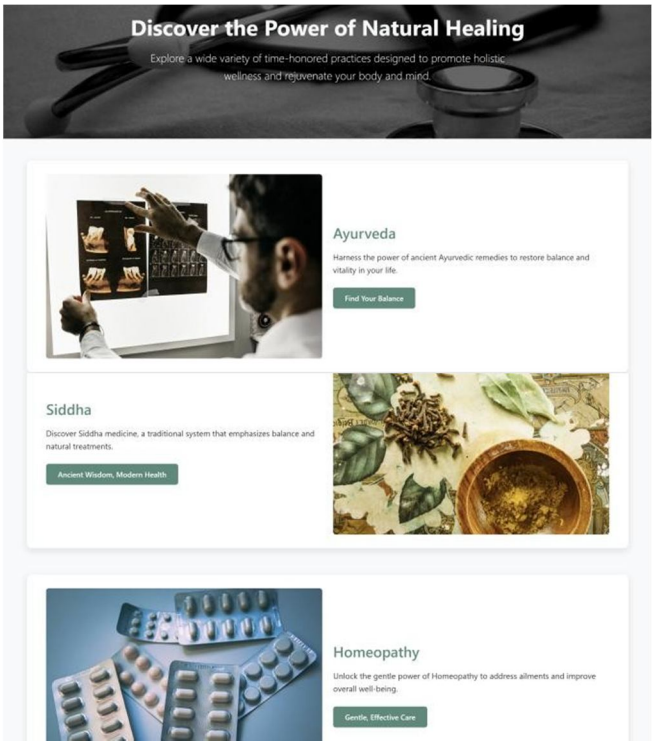
The website provides a vast library of therapeutic flowers, plants, and herbs online. Everything listed includes botany, how to grow them, traditional as well as scientific uses, great photos, and instructions for DIY maintenance. This database may be searched, filtered, and browsed by therapeutic class, by plant name, or by health benefit. Licensed Ayurveda practitioners review and update the database periodically before starting practice.

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D. Multilingual and Culturally Inclusive Interface

The Google Translate API is integrated into the Virtual Herbal Garden for optimal accessibility, allowing users to view all content in their preferred language. The feature enables students from all linguistic and cultural backgrounds to potentially access the educational platform's resources by removing the language barrier and promoting inclusivity for erbalism courses.



E. Features for Easy Navigation and Immediate Access

The website is easy to use and provides quick access to key resources such as the herbal drug library, plant encyclopaedia, cultivation and identification facilities, user community message boards, and research collections for the academic community. The simple links provide the user with fast access to scholarly resources for herbal medicine, communication facilities, as well as fast access to information.

F. Peer Learning and Community Engagement

A strong community forum allows the members to speak with one another, share experiences, ask questions, and share gardening and herbal medicine advice. This peer learning results in cooperative knowledge production and offers support for the users when they seek wellness. Garden offers a responsive interface that adapts easily to desktops, tablets, and mobile devices. This guarantees a seamless and enjoyable user experience for all platforms.

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G. Integration of Scholarly and Practical Resources

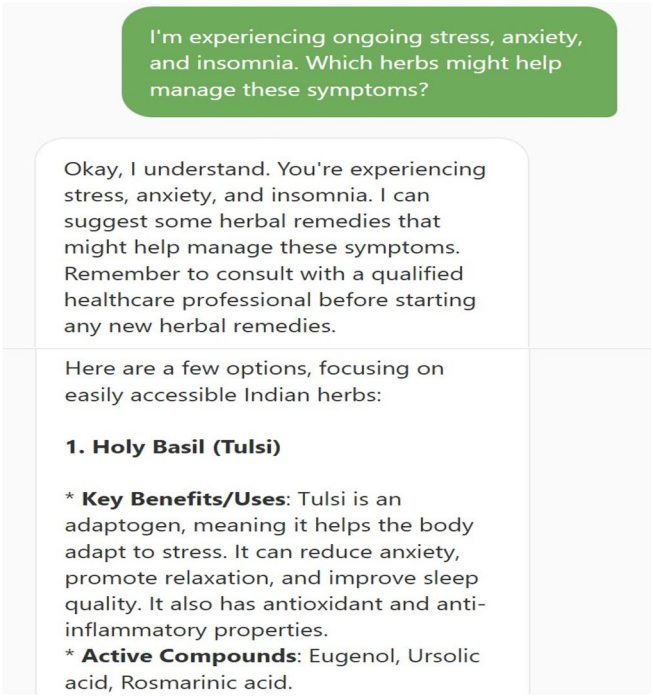
The website connects the user with a carefully selected set of research studies, scholarly articles, and classic Ayurvedic works. This combination allows the professional as well as the beginner to resort to guidance from tried sources of knowledge and keep abreast of the latest Developments in herbal medicine.

H. Responsive and Adaptive Layout

The Virtual Herbal Garden was built using the latest technology for the Internet, so the website framework adjusts easily between desktop, tablet, and cell phone devices.

VI. CASE STUDY: HERBAL REMEDIES FOR STRESS AND ANXIETY

To check the practical efficiency of the AI chatbot, we tested a question about long-term stress and sleep disorders. The chatbot provided answers with rational suggestions of Brahmi and Tagar along with the information about preparation, dosage, what to combine with and watch for results. This mini-experiment allowed the chatbot to be recognized as an AI-powered herbal assistant for the new herbal medicines exploration and the alteration of the traditional ways.



VII. DISCUSSION

We experimented with a query on chronic stress and sleep disorder to understand the real-life functionality of the chatbot and how practically it is valuable.

The chatbot provided replies that were supported by scientific evidence in the form of the use of Brahmi and Tagar, together with the preparation, the amount to consume,what to pair with it and monitor for effects. This small trial confirmed that this chatbot can be used as an AI-powered herbal assistant for exploring herbal medicines and changing the traditional methods.

A. From Ancient Roots to Modern Applications

The interest in herbal and traditional medicine like Ayurveda isgrowing worldwide which shows a global desire for broad, sustainable healthcare alternatives. The Virtual Herbal Garden grasps digital technologies to preserve and promote this heritage, making it accessible to a generation surrounded by digital tools. The technologies such as 3D kits and closer pictures supportive in the attraction of more users and enhanced retention of botanical knowledge, research demonstrates that availing and interpreting of site usage is involved in this form of research visual information that is interactive enhances learning performs in comparison with uninteresting and stagnant material.

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B. Enhancing Accessibility and Inclusivity

One of the greatest strengths is the role that the platform plays with regards to the management of the easy retrieval of the information on the site. The Google Translate API will be integrated so that it can be used by the users. There are also the reliable sources availed to those who are of different language backgrounds and pertinent knowledge regarding the medicinal and herbal plants. It is especially important to persons who will face the language problem areas in which the language differences have seriously restricted the access of health education materials to a significant extent amount of time. User friendly interface that can be read by a user can work in any age group, with an assisted and guide movement and prompt access to certain features, mitigates the high preciousness of price against any entry still further, and the more educational usability of herbal medicine among downs-Corner to Corner and seasoned and masterful spirits.

C. Building User Confidence with the Help of AI and Community Interaction

The virtual herbal is the top position being motivated by AI chatbot. The sole selling option that is present in the virtual herb platform of garden is what keeps the Virtual Herbal Garden apart Drastically, the regular plant databases. In providing evidence-based users with customized solutions suggestions, the chatbot dares people to travel into herbal medicine founded on the user requirements and based on their consideration at resonance at health concerns. This not only supports not only individuals but also informed choices are promoted about natural therapies. The community characteristics, such as peer discussions and forums, facilitates shared and interactive learning and pursuit of practical past feel to such a degree that they do not repeat such mistakes by others, which enhance its overall user experience and introduce a feeling of fit in and feel at home among users so that they become accustomed to our website.

D. Addressing Challenges and Limitations

The Virtual Herbal has certain innovative and unique features; however, it does not appeal to everyone Garden is confronted with a number of challenges. It is very much important to ensure that the information on the plant is correct and reliable, particularly with a combination of traditional knowledge with modern scientific findings. The site serves this purpose in the form of absorption of qualified Ayurvedic specialists whose there is also the proper certification of credentials in the verification of contents. Another problem is scaling as the scale is also unclear customers will be increased more and of high quality connections and fresh and contemporary contents will need still required investments in technologies and man expertise

E. Future Directions and Broader Impact

To the future, the Virtual Herbal Garden is developable and transformed into a highly diverse and vibrant body of herbal learning center. The cafe of tomorrow can be enhanced with a special mobile application, virtual reality (VR) or we can experience realistic plants with the help of augmented reality (AR) also make/ incorporation of wearable health wearables, and learning-based artificial intelligence (AI)systems which learn with history and give up ever-increasing personalized recommendations. consultancy meetings with real and registered. Ayurvedic practitioners will be able to minimize the problems of digital and face-to-face care.

This system would be able to render medicine and healthcare sustainable and accessible. By stressing the transparency, engagement and accessibility, it would generate greater dependence on Artificial: natural treatments and integrative medicine, As the world of herbal continues to be revolutionized by intelligence speeding up new compounds, medicine increasing formula accuracy and increasing product safety, the Virtual Herbal Garden has a good opportunity to make its share of contributions.

VIII. FUTURE ENHANCEMENTS

1) We can create a dedicated mobile app
2) Use of Augmented reality (AR) for realistic plant interactions,
3) Integration with fitness trackers and wearable health devices for real time fitness data of user.
4) AI systems that learn from user history to provide increasingly personalized recommendations.
5) Consultation sessions with real and registered Ayurvedic experts

IX. CONCLUSION

Virtual Herbal Garden is a new form of advertising traditional (Ayurvedic) health practices. Using 3-D visualizations, chatbot system based on AIs, and several, it becomes accessible to learning because of language availability medical plants and Ayurvedic experience.

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This site does not only teach people, but it also provides them with by administering them the researched correctly and individually herbal recommendations. It also provides information in alternate languages which implies that it is available to a nationwide people, more so people who remain in the small towns and rural areas. Virtual Herbal Garden is one of the threads, which links the past healing processes into the new age. It reinstalls natural solutions to healthiness in an easy-to-use form which is fascinating to the present electronic age, and which brings back to mind more consciousness and exploitation of plant maintenance. The project is expected to expand the market since the demand of medicine is on a continued increase plays a great role in education, innovativeness, and custom in one easy platform.

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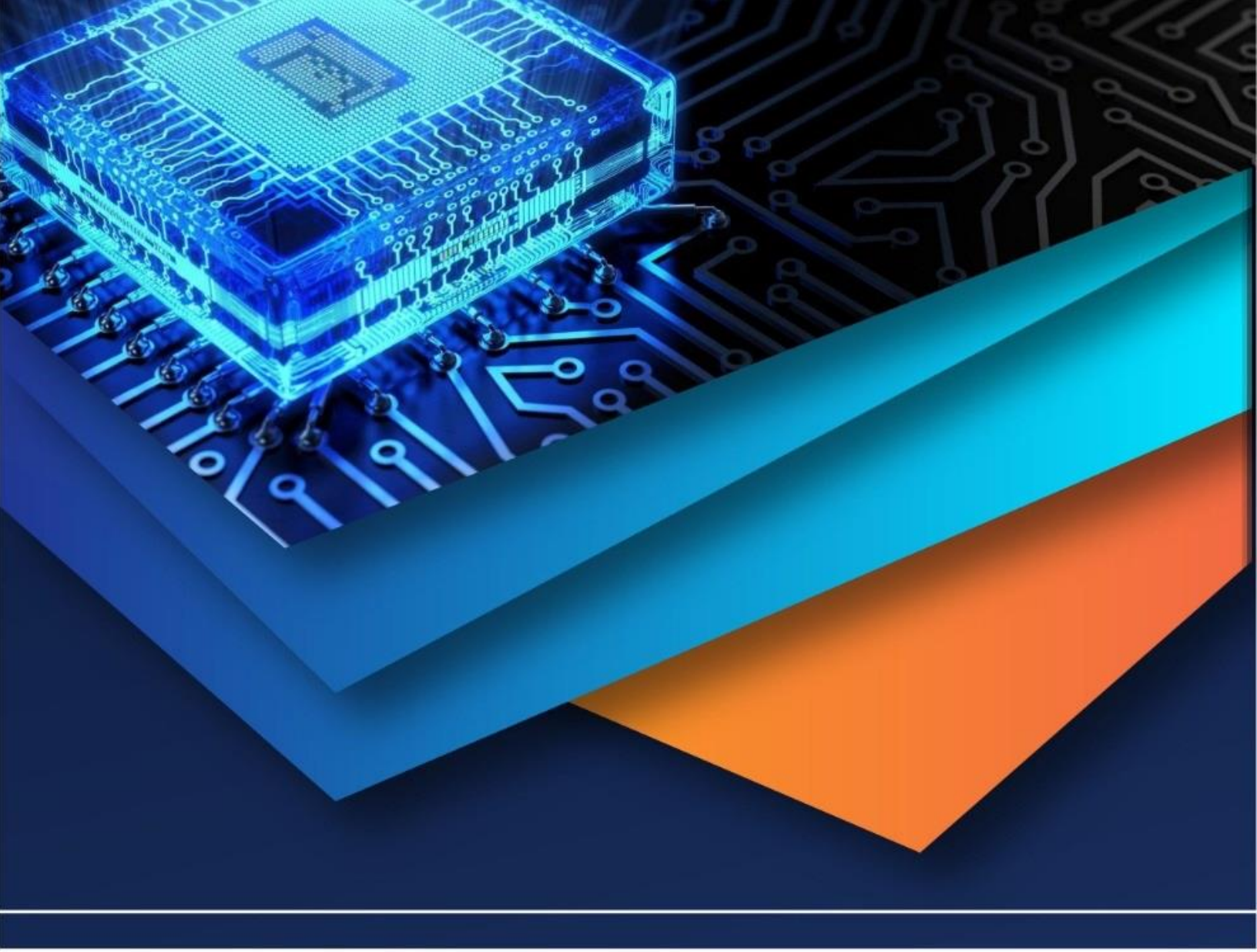
X. ACKNOWLEDGMENT

We acknowledge our deep sense of gratitude towards Prof. Vishwesh Deshmukh for the abiding support and guiding expertise throughout the course of this work. His encouragement along with expert guidance helped a lot towards the successful culmination of this task.

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