

Research on Intelligent System for Land and Plot Management- SmartPlot

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Abstract:

We all When people buy property, they usually focus on legal documents, price, and basic technical checks. However, one important factor is often ignored—whether the property actually fits their lifestyle and daily needs. Because of this, many buyers end up making decisions that may not be suitable in the long run. Also, since civil engineering knowledge is not easily accessible to everyone, people often depend on others and may even face risks like fraud.

To solve this problem, this paper introduces SmartPlot, an Android-based application that helps users evaluate properties in a simple and practical way. It considers technical tests, risk factors, and lifestyle preferences, and then generates an easy-to-understand report. The aim is to help users make better decisions and choose a property that truly matches their needs.

Keywords — *Choice Test, Moisture Testing, SBC test, Future Risk analysis, Nearby Location, IoT, Cloud Computing*

I. INTRODUCTION

Nowadays, people usually search for property that fits their budget, but often overlook whether it truly suits their lifestyle. Most buyers focus only on legal documents and financial aspects, ignoring several other important factors that play a crucial role in making the right decision.

One of the key factors is soil quality, which is essential for building safe and durable infrastructure. Before constructing a house, it is important to test the soil's quality, texture, and especially its Safe Bearing Capacity (SBC). If the SBC is not appropriate, it can lead to serious structural problems. Soil testing helps determine whether the land can safely support the weight of a building. The quality of soil depends on factors such as weather conditions, climate changes, and the previous use of the land.

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rather than create difficulties. however, in the field of civil engineering, there is limited use of user-friendly technology that can guide common people in making such decisions. due to this, many buyers neglect essential checks and may face issues later. additionally, the application provides insights into future developments or infrastructure projects near the property, which can help users evaluate its potential resale value and overall growth. this is especially useful for both residential buyers and investors. a thoughtful and informed decision can turn a house into a home, bringing long-term satisfaction and comfort.

II. PROPOSED METHODOLOGY

Soil moisture plays a vital role in environmental monitoring, agriculture, and hydrological studies. Crop yield depends on factors such as temperature, humidity, soil moisture, and pH. In this work, a soil moisture monitoring system is developed using a low-cost FC-28 sensor

interfaced with a CC3200 Launchpad, integrating IoT, cloud, and mobile technologies. Experiments were conducted on red and black soil samples at room temperature, and moisture levels were recorded and analysed.

In addition, land surveying is important in both earth sciences and legal processes, especially in resolving land disputes. Since courts lack technical expertise, they often rely on survey reports without fully evaluating their accuracy. To overcome this, a peer review system is suggested, where experts analyse and verify survey reports scientifically.

The study examines errors in 176 land surveys and classifies them into design, procedural, and technical errors, further divided into major and minor categories. It also proposes testing, technological, and error-analysis methods to improve the quality of survey reviews. These approaches help ensure more accurate, reliable, and fair decisions in land-related cases.

III. PROCEDURE

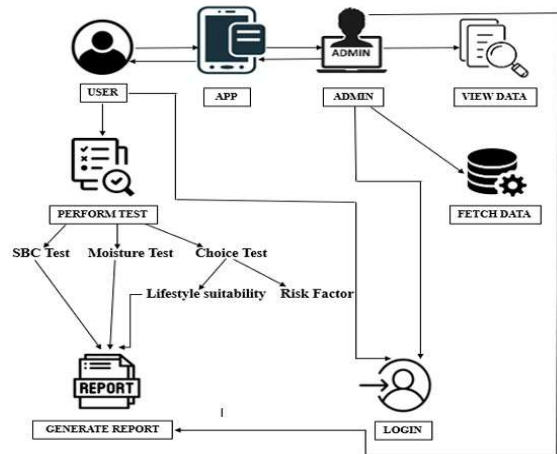
When the user opens the application and logs in using secure authentication. Once logged in, the user can interact with the application and select the option to perform different property evaluation tests. At the same time, the admin manages the system from the backend, where they can view user data, fetch stored information, and monitor overall system activity.

After accessing the application, the user performs various tests provided by the system, such as the Safe Bearing Capacity (SBC) test, moisture test, and choice test. The SBC test helps determine the load-bearing capacity of the soil, while the moisture test identifies whether the soil is dry, moist, or wet. The choice test focuses on evaluating lifestyle suitability and identifying possible risk factors related to the property.

During this process, user perform the moisture test and then the user collects data from IoT sensors (such as moisture and temperature) along with user inputs related to preferences and requirements. This data is then sent to the Firebase cloud, where it is securely stored and can be retrieved whenever needed. The application processes and analyses both technical data and

user inputs to perform a complete evaluation of the property.

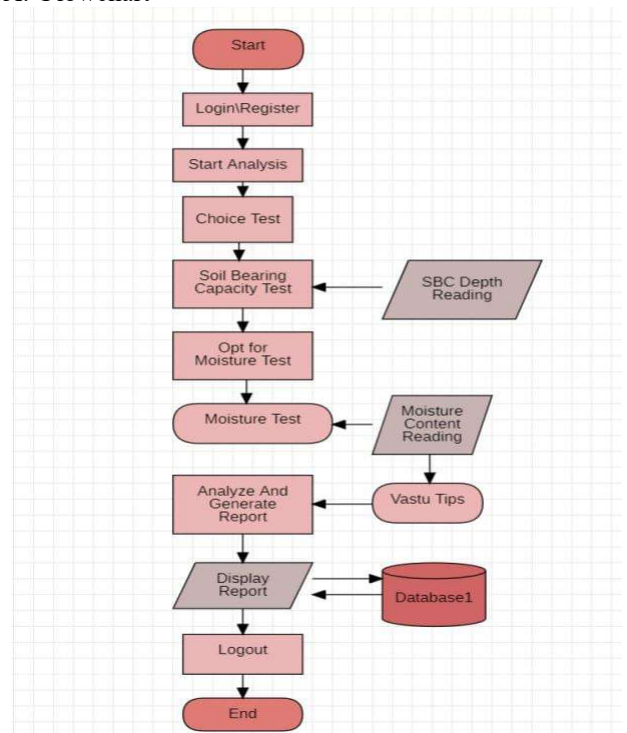
Based on this analysis, the system generates a detailed report that includes the result of all the tests performed by the user. The final report is displayed to the user through the Android application and can also be downloaded in PDF format in the users mobile phone. This entire process helps the user make a well-informed and confident decision while selecting a suitable property.



[Fig. 1 Procedure of application]

IV. ALGORITHM AND FLOWCHART

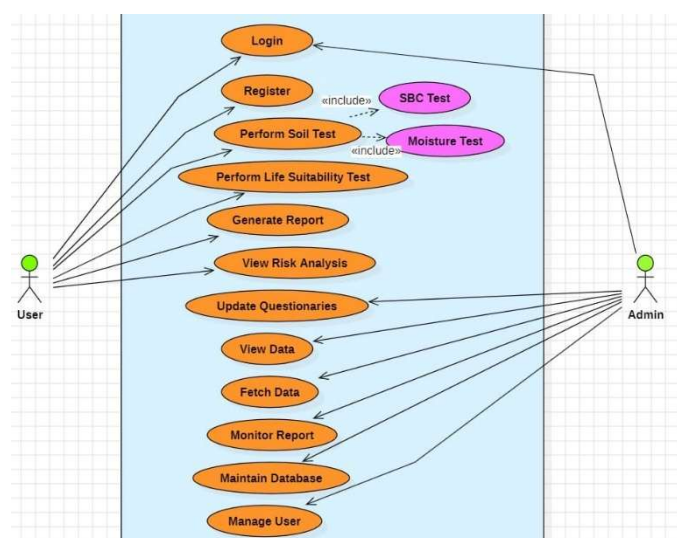
A. Flowchart



B. Algorithm

1. Start
2. Login or Register user
3. Start analysis
4. Select test option
5. Perform soil bearing capacity test
6. Take SBC depth reading
7. Choose moisture test option
8. Perform moisture test (if selected)
9. Take moisture content reading
10. Generate Vastu tips based on readings
11. Analyze data and generate report
12. Store report in database
13. Display report
14. Logout
15. End

C. Use Case Diagram



V. CONCLUSIONS

The SmartPlot – intelligent property selection system has been designed to simplify and modernize the process of evaluating land or property before purchase or construction. traditional methods for checking soil strength, moisture, and environmental suitability often require manual inspection and expertise. this system transforms those complex steps into a simple, automated digital process available through an android application by integrating modules such as soil bearing capacity test,

moisture test, and lifestyle suitability analysis, the system provides users with a single, detailed report that summarizes the strength, safety, and suitability of a plot. The system presents a practical and user-friendly solution to improve the property-buying process by combining civil engineering concepts with modern technology. unlike traditional methods that mainly focus on legal and financial aspects, this system considers important technical factors such as soil condition, moisture levels, and safe bearing capacity (SBC), along with lifestyle compatibility and risk analysis. In conclusion, SmartPlot helps users move beyond basic checks and supports them in selecting properties that are not only safe and valuable but also suitable for their lifestyle, ultimately turning a house into a true home.

VI. LITERATURE SURVEY

The literature survey helps in understanding existing technologies and identifying gaps for improvement. In recent years, technologies like Internet of Things (IoT) and Cloud Computing have been widely used for monitoring systems, especially in agriculture.

Many existing systems use sensors such as FC-28 Soil Moisture Sensor to measure soil parameters like moisture, temperature, and humidity. These systems mainly focus on improving crop production and irrigation management.

However, very few systems are designed for land evaluation in terms of construction or property investment. Most traditional methods depend on manual surveys and expert analysis, which can be time-consuming and costly.

The proposed project SmartPlot aims to overcome these limitations by combining IoT, SBC test, and a mobile application to provide a smart and easy solution for selecting suitable land for users, builders, and investors.

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