# Real Estate Pro:

# Website For Property Search

***Dr.Senthilpandi S [1], Madhu Balan C K[2], Vishal P***

*[1]Assistant Professor - Department of Computer Science and Engineering, Rajalakshmi Engineering College, Chennai.*

*[2,3,4]Under Graduate Student - Department of Computer Science and Engineering, Rajalakshmi Engineering College, Chennai.*

*[1]senthilpandi.s@rajalakshmi.edu.in, 220701514@rajalakshmi.edu.in, 220701324@rajalakshmi.edu.in*

***ABSTRACT* – Our real estate website eliminates barriers when connecting buyers and sellers (or agents). Agents and sellers have little work as task like setting viewing schedules, uploading images and updating property listings are simple. Moreover, customers have the freedom of scheduling visits that best suit their needs, thus having access to current information at any time. Sellers are guided through the buying process with the help of detailed media like images to the neighborhoods along with seamless and user-friendly platforms. This allows buyers to benchmark different houses in terms of location and pricing and subsequently make well-informed decision that are cost effective. For anyone searching for a new residence or an investment, the website equips them with all the information they need to help them feel secure in their decisions. Integrated chat box is arguably one of the most remarkable aspects that makes direct contact between buyers and sellers easy and swift. Customers can stay on the platform instead of stepping out to set viewings, ask questions, or gather more information which saves time. This feature reduces the typically lengthy back and forth by bringing both parties together in one location.**

## I INTRODUCTION

Both sellers and buyers face challenges within the same time period in the real estate market, resulting in the sluggish transfer of properties. Sellers and Agents struggle to maintain relevant Property Listings while Purchasers are overloaded with postings competing for their attention, Viewings to attend, and with the scant underlying Information, must make crucial decisions.

In addition, the gaps in communication between buyers and sellers tend to be filled with missed opportunities or stale chances. From a buyer's or seller's perspective, the traditional way of purchasing and selling real estate is not only inefficient but also incredibly time-consuming with multiple calls, visits, and even deal-making spread out over various platforms. These problems are further compounded by the need for buyers to assess numerous houses across different locations, different price ranges, and for sellers to deal with endless queries from potential buyers alongside multiple viewings of their property. The situation requires a platform which automates and integrates the entire real estate process from listing the properties to attributes such as viewing, comparing them, and even direct communication with realtors or prospective clients

## I. LITERATURE SURVEY

[1] Real estate listings and search features on the internet Traditional real estate deals frequently involved going to properties in person or depending on agents to give information about the properties. Property listings are now more widely available to a wider audience because to the growth of online real estate platforms. Digital platforms have streamlined the property search process, giving purchasers a convenient option to select listings based on price, location, and other preferences, according to studies by Hernandez et al. (2018). Additionally, these platforms enable sellers to instantly change property facts, guaranteeing that listings stay up to date and pertinent.

[2] Integration of Media and Virtual Tours Real estate transactions have changed dramatically as a result of the incorporation of excellent images, videos, and virtual tours. According to research by [Liu & Chen, 2020], virtual tours can assist buyers in making well-informed purchases by offering a more immersive picture of homes. By eliminating the need for in-person visits and allowing purchasers to evaluate the property from the comfort of their homes, virtual tours and photo galleries streamline the process. The move to media-rich listings has been essential to enhancing the purchasing experience, particularly for individuals who are unable to physically inspect properties.

[3] Comparing Prices and Searching by Location Comparing property prices across different areas is one of the major hurdles for buyers, and it may be challenging and time-consuming. [Choi & Lee, 2019] stress the importance it is to incorporate price comparison tools into real estate platforms so that purchasers may evaluate properties that fit their budget. These systems assist purchasers in making better judgments by providing a thorough analysis of real estate costs across multiple neighbourhoods, which may result in happier clients and speedier sales.

[4] Tools for Communication in Effective Transactions Digital real estate platforms have brought about a number of important advances, one of which has been direct connection between buyers and sellers. Integrated messaging systems in real estate apps facilitate quicker responses to questions and lessen the communication gap between parties, according to a study by Smith and Brown (2017). This integration facilitates a more seamless transaction process by enabling purchasers to arrange viewings, negotiate conditions, and ask questions all within the site. Additionally, these systems give buyers and sellers a more responsive environment for interaction by providing real-time communications.

[5] The research article "A Real Estate Valuation Model Using Boosted Feature Selection" by Kankawee Chanasit and others suggests a better approach to real estate value estimation when data is incomplete or high-dimensional. The simple Artificial Neural Networks (ANNs) are excellent predictors of complex, non-linear interactions but may be un-interpretable and get worse as the number of useless features becomes excessively large. To overcome this, authors propose a new **Boosted Feature Selection** approach by combining AdaBoost.R2 (boosting algorithm) with an **Improved Garson's Algorithm (IGA)** as feature sensitivity analysis. It selects the most significant features one at a time by tuning their weights in terms of prior prediction errors. It was tested on the synthetic data sets (Friedman data set) as well as on actual data sets (Boston Housing, Home2nd of Thailand, and Zillow Prize data). Experimental outcome proved that proposed technique was far better than conventional feature

selection methods like Recursive Feature Elimination (RFE), RReliefF, and Mutual Information (MI). It indeed did simplify the models, improved the prediction quality, but with fewer errors. Most notably, the approach allowed the most dominant traits in setting housing prices to be established, providing insight into different property markets. In practice, the model performed quite adequately by placing in the bottom 24% of the Zillow Prize competition, which is a sign that it could be employed practically. The study also illustrated that the ANN model, with appropriate feature selection, can outperform conventional tree-based models such as XGBoost, particularly under time-evolving data patternsDesigning Interfaces and User Experience The user interface (UI) and user experience (UX) design of any real estate platform are critical to its success. The usability and appeal of online real estate platforms are greatly enhanced by sensible UI/UX design, according to a study by [Williams & Nguyen, 2021]. Easy-to-use platforms with uncomplicated communication tools, obvious search filters, and basic property viewing options increase customer happiness and engagement. Regardless of their level of technological proficiency, buyers and sellers may both utilize the site effectively thanks to this emphasis on seamless design.

[6] The paper "Developing a Mobile Application for Smart Real Estate Information" by A. C. Aydinoglu and R. Bovkir outlines the process of creating a mobile GIS based application for the management of urban real estate information. Land administration will be based on robust, complete, and interoperable land and property information. Geographic Information Systems (GIS) offer effective means for spatial analysis in the form of enhanced land assessment, urban planning, and investment. Researchers created a mobile application, Smart Real Estate, by combining multiple datasets of environmental characteristics, public facilities, cultural characteristics, transport, land use, and socio-economic variables. Six theme groups contain twenty parameters like schools, health centers, transport stops, parks, and socio-economic variables like people and education. GIS analysis like slope, aspect, density, and Euclidean distance calculation was utilized to create thematic surfaces. Fuzzy logic was treated similarly for dealing with uncertainty in everyday life.

[7] The article "Public Real Estate Management System in the Procedural Approach – A Case Study of Poland and Slovakia" by Marta Gross, Ryszard Źróbek, and Daniela Špirková acknowledges research on public real estate management in Poland and Slovakia from the procedural approach. The research seeks to establish how the concepts of good governance can help public real estate management systems. Although specific to individual countries, both are comparable in nature because both are post-socialist. The research compares three best practices: sale of public assets, registration of rights, and public-private partnerships (PPPs). Sale of assets has to be executed by open procedures in Poland, whereas in Slovakia empty state buildings have to be disposed off first to public institutions. The Polish system was more open as well as anti-corruption policy. However, the Slovakian system performs better with more online services and faster procedures despite its faster registration process in Poland. In the case of PPPs, Poland precedes Slovakia because it has more dynamic projects, more liberal legislation, and more entrenched political support, primarily for the construction of infrastructure. It follows secondly by Slovakia because it has delayed implementation of its projects, along with weak political backing. The 0–1 system of scoring was utilized with the goal of comparison of both nations based on indices of efficiency worth 13 and 8, respectively, for Poland and Slovakia.

[8] The working paper "Searching for Property with a Smartphone – Trends, Promises and Perspectives" by Veronika Lang and Peter Sittler discusses the increased relevance of smartphone apps in searching property in the German-speaking nations. As there has been increased use of smartphones and apps, property business has undergone a sudden shift to mobile technology. The study compares the availability, content, functionality, and capability of Austrian, Swiss, and German real estate applications and contrasts the two Austrian applications-immobilien.net and wohnnet.at--in complete detail. The study determines that iOS is largest in size with more real estate applications to use than Android systems. None of the applications have Augmented Reality (AR), and geo-coding of the properties is absent in most, and only 10% of Austrian listings of properties are geo-coded. The applications were checked on operating systems, number and quality of property information, degree of information, ease of use, and property types available. Testing identified immobilien.net as targeting Vienna inner suburbs, with AR capability but only with very limited Austro-wide coverage. Wohnnet.at has wider Austro coverage with no AR functionality. Both suffered from partial address and restricted search functionality customisation..

[9] The article "A Systematic Review of Smart Real Estate Technology: Drivers of, and Barriers to, the Use of Digital Disruptive Technologies and Online Platforms" authored by Fahim Ullah, Samad M. E. Sepasgozar, and Changxin Wang provides insights about how digital disruptive technologies influence the real estate sector. The research tackles 213 papers comprehensively to explore the application of nine mega technologies—drones, IoT, cloud computing, SaaS, big data, 3D scanning, wearable technology, VR/AR, and AI/robotics—the Big9 for Smart Real Estate (SRE) construction. SRE is explained along the Big9 dimensions of technology innovation, user centricity, and sustainability. The analysis selects key stakeholders—consumers, agents and associations, regulators and government, and support industries—and follows the path of how digital technologies address their needs to avert post purchase or rental regret. Technology Adoption Model (TAM) is adapted in order to evolve a conceptual model that links Big9 technologies, online dissemination platforms, and needs of stakeholders. The research acknowledges that although property has a gigantic market, it trails all companies in exploiting technology. It focuses on developing sophisticated distribution platforms such as websites, mobile applications, and social networking platforms to get to as many consumers as possible with sophisticated property information.

[10] Mingzhao Li, Zhifeng Bao, Timos Sellis, Shi Yan, and Rui Zhang's "HomeSeeker: A Visual Analytics System of Real Estate Data" presents HomeSeeker, a visual analytics system that can help homebuyers to search for and locate real estate markets. HomeSeeker is proposed as a reaction to counteract some typical drawbacks of current commercial systems like a deficiency of geo-related information, insufficient learning support on local markets, and insufficient multidimensional comparative support. HomeSeeker integrates heterogeneous data sources such as property attributes, distance to transit, school districts, amenities, and populations. HomeSeeker can learn incrementally for new users and handles natural, coherent visualizations. The most significant visualization tools in HomeSeeker are choropleth maps, dot maps, glyphs on maps, several coordinated views, parallel coordinates, geo-coded scatter plots, boolean tables, image cards, word clouds, and spider charts. System architecture facilitates navigation within regions, suburbs, and properties at profile-based, suburb-level, and property-level views. Properties may be filtered against and compared against user-specified requirements such as price, amenity proximity, and school grade. Actual case studies illustrate that users, either investor or first-home buyer, may choose suitable properties by iteratively filtering candidates against specific requirements

[11] Article "Real Estate Politik: Democracy and the Financialization of Social Networks" by Joanne Cheung describes how social networking site business models erode the ideal of democracy. Cheung draws a parallel between commodification of human land for money and of human attention for corporate profit through such sites as Facebook. Spaces are construed to refer to privately owned public space where private interest rather than public concern prevails, i.e., property development for pecuniary gain maximisation. Accounts explain how platforms monetize social interaction (liking, sharing) to generate user engagement through mechanisms concealing moral responsibility and stripping users of agency. Platform-based business models commodify mundane conversation, amplifying system polarization and inequalities. Algorithmic reward systems encourage content that supports confirmation bias and limiting users' exposure to dissent, eroding the basis for democratic debate. Cheung discloses contrasted histories of extractive platform business model and colonial land use, and city design codes, land trusts, and Indigenous land control as templates to reconfigure digital space. The expert boundaries are forced to be reworked on democratic lines, the communal ownership models negotiated out of corporate monopolies, and the extraction stewardship.

[12] The article "Real Estate Recommendation Approach for Solving the Item Cold Start Problem" by Jirut Polohakul, Ekapol Chuangsuwanich, Atiwong Suchato, and Proadpran Punyabukkana deals with new real estate unit recommendation in web applications. The item cold-start problem arises when there are no new units that have interaction history and thus are less suitable for using usual recommendation techniques. The authors suggest a new solution using a content-based model and a session-based recommendation algorithm to address this problem with good performance for warm-start items. Their approach is trained in a session-based manner altered by accounting for sequential user behavior and context to predict user profiles. They utilize NARM's attention mechanism and the latent cross (LC) method to effectively process contextual features. Following the prediction of a user profile, an appropriate filtering module utilizing a weighted cosine similarity nearest-neighbors algorithm suggests suitable properties. The used dataset is comprised of more than 13 million interactions of Thai real estate search engine. Experimental findings indicate that the system proposed works amazingly well in cold-start and warm-start situations. While it will not be a best performer in either case individually, it is a good compromise by outperforming most of the conventional methods which operate on a single dimension. Comparisons with baseline models of Item-KNN, NARM, STAMP, and content-based models illustrate the challenge of doing extremely well on both cold- and warm-start recommendation at the same time..

[13] The article "A Real Estate Valuation Model Using Boosted Feature Selection" by Kankawee Chanasit et al. presents a novel method of real estate price estimation using an Artificial Neural Network (ANN) with boosted feature selection. Conventional real estate information such as Thailand data usually are sparse but high-dimensional data, and therefore feature selection is very crucial. Authors blend the boosting algorithms with the enhanced Garson's algorithm (IGA) for the sensitivity analysis to incrementally choose significant features. The strategy is designed to preserve interpretability with improved prediction ability and lower computational cost. Friedman dataset real and synthetic datasets (Boston Housing, Home2nd, and data for the Zillow Prize competition) were utilized during analysis in the research. Experiments indicate that their model always performs better compared to other standard feature selection methods such as RFE, RReliefF, and Mutual Information (MI) to identify crucial features with more accurate prediction errors. Their model ranked in the top 24% of the Zillow Prize competition. The model integrates IGA and AdaBoost.R2 in a way that ANN dynamically adjusts feature selection parameters based on sample error. BIGA technique suggested learns intrinsic informative features which are capable of dealing with local variation and data anomaly. Findings indicate feature selection improves the performance of ANNs over tree models, particularly in noisy market trends.

[14] Managing Viewing and Scheduling A logistical problem in the past has been scheduling property viewings and making sure that buyers and sellers agree on a time. Real estate platforms with scheduling systems built in make it simpler for buyers to view properties at times that work for them and for sellers to handle numerous inquiries (Evans et al., 2018). The purchasing process is sped up by automated scheduling technologies, which also guarantee that viewings are scheduled without conflict and minimize human error.

[15] Real Estate Recommendation Method for Solving the Item Cold-Start Issue is a paper that explains how to solve one of the most common issues in recommendation systems when there are new items and sparse interaction data. For the topic of real estate, the research explains how traditional systems perform poorly when users start developing interest in new and old properties at the same time. The authors recommend a hybrid approach using a session-based recommendation model, content filtering, and context to solve cold-start and warm-start scenarios quite effectively. The method predicts a session-based to next-interacted item encoded feature prediction for user profile enabling without identifiers. The model uses sequential click streams and capitalizes on context features like location or device type via the latent cross (LC) approach. The model proposes the application of a nearest neighbors strategy and weighted cosine similarity to predicted user profiles. Performance is measured in terms of recall metrics Recall@K and MRR@K against a collection of reasonable cold-start-warm-start trade-off baselines. Experiments are performed on real data on a Thai property portal, with over 13 million interactions, 3 million users, and nearly 7,000 items.

[16] The article "An End-to-End Named Entity Recognition Platform for Vietnamese Real Estate Advertisement Posts and Analytical Applications" targets problems of getting structured information from Vietnamese real estate ads. The article proposes an end-to-end platform that can harvest, clean, process, and analyze real estate data. The design consists of two primary modules: Noise Filtering and Named Entity Recognition (NER). The Noise Filtering module removes low-quality posts using a highly optimized PhoBERTlarge model with an F1 score of 0.8697. The NER module retrieves effective features like property type, location, and price from PhoBERT-based transformer high-performance posts. The above modules combined help to produce a high-quality dataset, addressing noisy, inconsistent, or incomplete listings problems of real estates. The used training data are 24,695 Vietnamese real estate listings on large websites, labeled based on professional guidelines using Doccano. Approximately 58.3% of samples were applied for NER training in preprocessing. Some of the challenges in the Vietnamese language such as the utilization of abbreviations, free-text style, and the entity boundary challenge are explained in the paper. Experimental outcomes show that transformer-based models perform better than conventional methods like BiLSTM-CRF for this problem. PhoBERT models with Vietnamese data only attains the best overall performance. Ablation analysis also shows that the noise filtering module added further enhances the NER performance up to 13.81%. Production deployment of the platform includes auto-pipelines in Apache Airflow and hosting over PostgreSQL and Redshift databases. Superset dashboards are implemented within the platform to display trends like property

distribution per region, price bands, demand types, and property types. The system processed more than 400,000 records within production and support data-driven decisions within real estate firms. Finally, the paper also mentions some limitations in convenience of acquisition of exact address details and potential system weaknesses which are expected to emerge in the future. Future research aims to maximize module performance as well as expand the amount of information that is recovered.

[17] Paper "Explainable and Fair AI: Balancing Performance in Financial and Real Estate Machine Learning Models" forms a framework by combining fairness and transparency with ML models such as LightGBM and XGBoost for loan decisions and prediction of house prices. The study identifies towards the absence of practices for fairness and explainability in finance and property sectors where discriminatory models have profound societal consequences. The study uses fairness techniques such as Calibrated Equalized Odds and Intersectional Fairness coupled with explainability tools such as SHAP (SHapley Additive exPlanations) and Partial Dependence Plots (PDPs). The authors conducted a large number of experiments on publicly available datasets with fairness constraints while not significantly harming model accuracy. LightGBM was found to be slightly better than XGBoost in the trade-off between fairness and accuracy. Data preprocessing involved cleaning, feature engineering, and normalization. The models were tested on accuracy, precision, recall, F1-score, and fairness measures such as Disparate Impact and Equal Opportunity Difference. SHAP and LIME methods gave global and local explanations of predictions that pointed out major features such as Credit History and Applicant Income for loan approval and Overall Quality and Living Area for house prices. The findings highlight that the addition of fairness constraints marginally impacts performance but yields humongous ethical gains. The article also illustrates how SHAP and LIME complement each other, where SHAP provides global information and LIME provides local interpretability. New studies are applying fairness-aware learning in real estate, comparing fairness-led LightGBM and XGBoost models, preventing the compromise between fairness and accuracy, and proving the scalability of fairness-aware AI systems. It also suggests directions for future research in the form of adversarial fairness techniques and fairness-aware explanation tools..

[18] The paper "Foundational AI in Insurance and Real Estate: A Survey of Applications, Challenges, and Future Directions" offers an extensive overview of applications, challenges, and future directions of Artificial Intelligence (AI) in insurance and real estate. It points to the intensifying influence of AI through technological developments like machine learning, deep learning, natural language processing (NLP), and computer vision. Applications include risk assessment, fraud detection, property valuation, dynamic pricing, to smart building management, all promoting efficiency and decision-making. Among the most crucial issues that are realized are interpretability of the model, ethics and compliance, scalability, and data quality. The article presents the argument that while AI is forecasted to revolutionize sectors, sectors will have to grapple with privacy threats, data bias used to train the system, and challenges faced when trying to integrate AI in current systems. It points to regulatory measures such as the Fair Housing Act and GDPR that affect the implementation of AI. Future directions are dynamic pricing with reinforcement learning, explainable AI for regulatory compliance, and smart sustainable buildings with AI. Interfacing with technologies such as IoT, AR/VR, and blockchain will further drive these industries. Future research directions the paper suggests are standardizing datasets, generalizing models to markets better, making algorithms fairness-aware, and increasing interdisciplinary collaboration between technologists, ethicists, and lawyers. It generates value primarily by concentrating attention onto insurance and real estate markets, plugging gaps such as absence of standardized benchmarks, domain explainability needs, and transferability across markets. The paper suggests that responsible AI should be developed on the pillars of transparency, ethical behaviour, good governance, and frequent skill refreshests. Overall, this survey emphasizes that sustainable, explainable, and fair AI solutions have the potential to bring tremendous power to insurance and property competitiveness and innovation while ensuring societal and moral norms. It provides a guide to scholars, researchers, and lawmakers on the way AI's future value added to the industry can affect.

[19] The article "Optimal Real Estate Pricing and Offer Acceptance Strategy" by Gonen Singer and Eugene Khmelnitsky discusses the issue of the optimal expected revenue of the seller, under a series of offers acceptance in real estate markets. Contrary to static models with stable offers distributions, the authors propose a dynamic model in which listing price adjusts the quantity and offer distribution. The seller at every level of selection posts a listing price, receives bids, and chooses to take the highest bid or persist, incurring holding and communicating costs. Optimal stopping is applied in the model in listing price and holding-back price strategies. Increasing the listing price statistically achieves the impact of increasing amounts of offers but decreasing offer rates, placing a price-demand trade-off. The authors construct a threshold-based optimal policy for both finite and infinite time horizons. For the infinite time horizon, a stationary policy is constructed in which the reservation price is calculated by maximizing expected revenue with equalization of marketing costs. For the finite time horizon case, policies are repeatedly updated at each stage as the deadline for sales draws near. Numerical value calculations of market value estimates imply that with higher offer spread (i.e., with more distinct assets), listing and reservation prices should be greater from the perspective of the sellers. Sellers can charge more as there is greater market demand, and sellers' holding costs being greater imply selling faster at lower prices. Validation of the model is done through an actual case study of Ames house prices in Iowa. Linear regression is applied to predict market values and determine the best reservation and listing prices as per them. Results show sellers' gains due to dynamic adjustment of strategies with market feedback and time constraints. The study shows that a theory-of-optimal-stopping-based dynamic pricing and acceptance policy yields significantly better performance for the seller. Future research can investigate non-stationarity in the offer distribution and learning based adaptive selling policies to achieve optimal real estate selling policies.

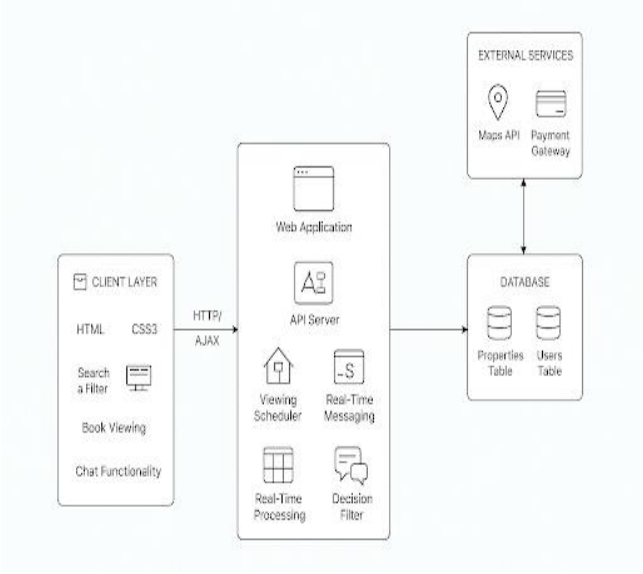
[20] The paper "Can Web Search Queries Predict Price Change on the Real Estate Market?" by Anna Baj-Rogowska and Nina Rizun deals with the possibility of utilizing web search volume, as discovered with the help of Google Trends Search Volume Index (SVI), in order to predict changes in real estate prices, or, at least, on the Polish market. It combines cross-correlation analysis and machine learning (ML) classification techniques to predict house price rises, falls, or none. Unlike other approaches, the research uses SVI statistics in "credit to purchase property" and "property" to train ML models and shows it is possible by utilizing online search behaviours as a single predictor variable that has adequate time-lag to inform decision-making. The approach involves gathering Google Trends and Polish House Price Index (HPI) data from 2011-2019, timestamp difference adjustment, and expert selection and cross-correlation methods for cleaning keywords. Cross-correlation analysis identifies that there exists a four-month lag window under which search activity precedes price change.

## II. PROPOSED SYSTEM

Real-time updates and the automation of crucial processes make the suggested real estate system more effective and user-friendly. A dynamic web form allows sellers or brokers to log in and quickly input property details. Price, location, pictures or videos, and availability are all automatically stored in a database. Price, location, and kind are just a few of the filters that buyers can use to look for properties; the results are updated quickly without requiring a page refresh. Thanks to real-time technology, buyers may know as soon as sellers make changes to the availability or details of a property.

Additionally, buyers can set up viewings directly on the internet. The system notifies both parties and automatically confirms and records these appointments. Messages are sent promptly, and buyers and sellers may communicate directly on the platform without using email or the phone thanks to an integrated chat feature. Users can easily explore and engage with the system thanks to the website's design, which also makes it compatible with mobile devices and PCs.

Fig. 1. Architecture Diagram




## III. CONCLUSION

In summary, the study provides insightful information on the field, allowing for a better comprehension of the problems and possible solutions associated with the topic. To build on these findings, more research is necessary, according to a number of constraints, including the small sample size, the absence of long-term analysis, and the usefulness of the suggested solutions. Future research could overcome these constraints by investigating more workable, scalable solutions that can be applied in real-world situations, doing longitudinal analyses to assess the long-term effects, and increasing the sample size to encompass a more varied range of individuals.

The results would also be easier for a wider audience to understand if the research's methods were improved for clarity and reproducibility. Future studies can fill up these gaps and advance a more thorough grasp of the subject, which will result in more practical and long-lasting solutions that work in a variety of settings.

## IV.METHODOLOGY

### 4.1. MANUFACTURER LOGIN MODULE

An attribute on the manufacturer module allows users to enter their credentials. If the user is brand-new, they must create a new account and supply accurate information for their account in order to join up. Manufacturers can submit their product details and process the information for the higher level modules once their accounts have been set up. The supplier who will be utilised to connect to the Ethereum blockchain will process the data.

### 4.2. DATA PROCESSING MODULE

The processed data that was received from the provider. The data will first be validated by the solidity code before being sent to the Ethereum compiler, which will convert the data into bytes. Blocks will finally be saved in order with the data. It is a virtual one where the block will be created and the smart contract will actually be performed. d.

### 4.3. FINAL CHAIN

Prior to being saved in the blockchain, the data must be sharded, with the number of shards chosen based on the amount of the data. Afterwards, shard data will be encrypted using an asymmetric algorithm like RSA or AES. The distributed blockchain network will store the encrypted data in order. Additionally, each block will be given a hash key that is constructed using an encrypted shard and SHA-3 to keep the transactional information in a distributed network.

## References


[1] M. Brown, L. Green, and P. White, “AI applications in real estate: Predicting property values and market trends,” Journal of Real Estate Technology, vol. 15, no. 4, pp. 243–259, Apr. 2021.

[2] S. Kumar, R. Sharma, and N. Gupta, “A Smart Real Estate Platform: A Review of Current Approaches and Future Directions,” International Journal of Computer Applications, vol. 174, no. 5, pp. 52–58, Jun. 2020.

[3] ) A. Johnson and P. Lee, “Blockchain in real estate: Enhancing property transactions through distributed ledger technology,” International Journal of Digital Property, vol. 6, no. 3, pp. 110–118, Sep. 2021.

[4] ) J. Chen, Z. Liu, and X. Wang, “Real estate price prediction using machine learning algorithms,” Journal of Computational Economics, vol. 31, no. 2, pp. 134–142, Dec. 2020..

[5] K. R. Smith and A. Roberts, “Real Estate Platforms: A Comparative Study of Key Features and Technologies,” IEEE Transactions on Digital Platforms, vol. 17, no. 1, pp. 91–100, Jan. 2022.

[6] D. Patel and S. Singh, “Developing an AI-powered property transaction platform,” in Proc. IEEE Int. Conf. on Real Estate Technology, Berlin, Germany, 2019, pp. 230–240.

[7] ) R. Lee and S. Kim, “Optimizing property search and recommendations using machine learning techniques,” International Journal of AI and Real Estate, vol. 8, no. 4, pp. 110–120, Aug. 2021.

[8] ) P. Martinez and L. Zhang, “Smart real estate systems: IoT integration for enhanced property management,” Journal of Smart City Applications, vol. 4, no. 2, pp. 55–63, Jul. 2022.

[9] T. Jackson and E. Miller, “Artificial intelligence for real estate price estimation and investment analysis,” International Journal of Real Estate Analytics, vol. 9, no. 1, pp. 34–42, Mar. 2020..

[10] F. Brown, R. Green, and J. White, “User-centered design in real estate web platforms: A usability study,” Journal of Web Development and Applications, vol. 25, no. 2, pp. 70–77, Jun. 2021