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## PHASE 2: INNOVATION AND PROBLEM SOLVING

### TITLE: AI AFFORDABLE HOUSE FINDER

#### INNOVATION IN PROBLEM SOLVING:

Innovation in problem-solving for an **AI-powered affordable house finder** can significantly improve how people discover low-cost housing, especially in urban environments with high demand. Here are several **innovative approaches** that combine AI and practical design to tackle the challenge effectively.

#### CORE PROBLEMS TO SOLVE:

##### **Smart Affordability Scoring:**

Use machine learning to calculate an *affordability score* based on a user's income, lifestyle, family size, and location preferences—not just price.

Personalizes listings beyond price filters, aligning options with real financial capability.

##### **Geospatial AI & Urban Heat Maps:**

Integrate geospatial AI to map affordable housing "hot zones" using satellite imagery, census data, and rental market trends.

Visualizes where affordable housing clusters are emerging or vanishing, guiding both seekers and policymakers.

##### **Conversational AI for Assisted Search**

Use a chatbot or voice assistant (e.g., WhatsApp bot or Alexa integration) that asks natural-language questions to refine searches.

Makes searching more accessible to people with low tech literacy or language barriers.

##### **Predictive Vacancy & Price Trends**

Train models on historical rental data to predict where and when affordable units will likely become available.

Gives users a strategic edge—like booking flights early based on price forecasts.

#### INNOVATIONS SOLUTIONS PROPOSED

##### **1.AI-Powered Personalized Recommendation Engine**

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- Uses machine learning to match users with affordable housing options based on:
  - Income level
  - Family size
  - Commute preferences
  - School proximity
  - Lifestyle needs

## **2. Smart Geo-Intelligence Mapping**

- Integrates GIS and satellite data to:
  - Identify developing or low-cost neighborhoods
  - Predict future affordability trends based on zoning changes, transit plans, etc.
  - Highlight areas with cost-effective living potential.

## **3. Real-Time Affordability Index**

- A dynamic scoring system that considers:
  - Rent/mortgage vs income ratio
  - Local job market conditions
  - Crime rates and cost of living
- Helps users make better-informed decisions.

## **4. AI Chatbot for Housing Assistance**

- Provides 24/7 support for:
  - Navigating listings
  - Understanding eligibility for housing subsidies or benefits
  - Application form assistance and documentation reminders

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## IMPLEMENTATION STRATEGY

### 1. Requirement Analysis & Planning

#### Key Actions:

- Define target users: low-to-middle income families, students, migrants, etc.
- Gather data sources:
  - Real estate listings (public and private APIs)
  - Government affordable housing databases
  - Demographic, economic, and geographic data
- Identify key features (e.g., recommendation engine, chatbot, map integration)

### 2. Data Collection & Preprocessing

#### Key Actions:

- Collect and clean data from:
  - Real estate platforms
  - Government housing portals
  - Geo-location services (e.g., Google Maps, OpenStreetMap)
- Preprocess data for consistency (remove duplicates, normalize fields, etc.)

### 3. Model Development

#### Key Actions:

- Build machine learning models for:
  - Housing recommendations (collaborative + content-based filtering)
  - Price prediction (regression models)
  - Neighborhood scoring (classification + sentiment analysis)

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- Develop AI chatbot for user assistance

## CHALLENGES AND SOLUTIONS

1.Data Availability and Quality :Incomplete, outdated, or inconsistent housing data. Limited access to government or NGO datasets.

2.Algorithmic Bias: Mitigating potential biases in AI algorithms that could lead to discriminatory or unfair housing recommendations.

3.User Trust and Adoption:

- Provide transparent and explainable AI-driven recommendations.
- Offer user-friendly interfaces and personalized support.

4.Complexity of Housing Market: Accounting for the complexities and nuances of the housing market, including varying property types, locations, and market conditions.

## EXPECTED OUTCOMES

1.Accurate Property Matching: The AI system provides accurate and relevant property matches based on user preferences, budget, and requirements.

2. Increased Accessibility: The system makes it easier for users to find affordable housing options, particularly for those who may face challenges in the traditional housing market.

3. Enhanced User Trust: The AI-powered platform builds trust with users, by providing accurate and reliable information, and personalized recommendations.

4. Increased Affordability: The AI-powered platform contributes to increased affordability in the housing market, by providing users with more options and better information.

## NEXT STEPS

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1.Integrate Additional Data Sources: Integrate additional data sources, such as social media, online reviews, or government databases, to enhance the platform's capabilities.

2. User Testing and Validation: Conduct user testing and validation to ensure the platform meets user needs and expectations.

3.