Product Requirements Document: Smart Air Purifier

Summary

This document outlines the product requirements for a new smart air purifier. The primary goal is to provide effective air purification for indoor environments and offer smart features for enhanced user experience. The target audience includes individuals and families in urban areas with high pollution levels and those with health concerns related to air pollution.

Key features include an advanced filtration system with a True HEPA filter, an activated carbon filter, and a pre-filter. The purifier will also have sensors for real-time air quality monitoring, including PM2.5, VOC, and odor sensors. Smart connectivity is a must-have, featuring Wi-Fi connectivity, a mobile application with a real-time AQI display, and voice assistant integration. The product will also have an automatic mode to adjust fan speed based on air quality and quiet operation for minimal disturbance.

The document proposes a tiered pricing model with three levels:

- **Entry-Level** for price-sensitive consumers, featuring basic filtration and a PM2.5 sensor.
- **Mid-Range** for users seeking smart features, including Wi-Fi connectivity and an automatic mode.
- **Premium** for health-conscious users, offering a 5-stage filtration system and advanced smart home integration.

1. Introduction

This document outlines the requirements for a new smart air purifier product, designed to address growing concerns about air quality as highlighted in the provided data. The product aims to offer effective air purification solutions across various segments, incorporating essential features and a flexible pricing structure.

2. Product Goals

- To provide effective air purification for indoor environments.
- To offer smart features for enhanced user experience and monitoring.

- To cater to different customer segments through tiered product offerings.
- To leverage data-driven insights (from the provided dashboards) to inform feature development.

3. Target Audience

- Individuals and families living in urban areas with high pollution levels (e.g., Delhi, Lucknow, Ahmedabad, Kolkata, Chennai, as indicated in "Top 5 Areas with High Pollution" and "Air Pollution Impact on Health Major Cities in India").
- Individuals concerned about specific pollutants like PM2.5, PM10, NO2, SO2, O3, CO (as per "Bottom and Top Pollutants of Southern India").
- Users seeking advanced monitoring and control over their indoor air quality.
- Customers looking for solutions to mitigate health issues related to air pollution (e.g., asthma, chronic respiratory diseases, hypertension, stroke).

4. Must-Have Features

Based on the provided data, the following features are considered essential for the smart air purifier:

- **Advanced Filtration System:**
    - **HEPA Filtration:** Must include a True HEPA filter capable of capturing at least 99.97% of airborne particles as small as 0.3 microns (including PM2.5, dust, pollen, pet dander). (Referencing "Different Brands of Indian Air Purifier with Features" which shows HEPA as a common filtration stage).
    - **Activated Carbon Filter:** Essential for removing VOCs, odors, and harmful gases like NO2, SO2, O3, CO. (Relevant to "Bottom and Top Pollutants of Southern India" and "Air Pollution Impact on Health Major Cities in India" where NO2 and industrial emissions are listed as major pollution sources).
    - **Pre-filter:** To capture larger particles and extend the life of HEPA and carbon filters.
    - **Optional/Premium Filtration:** UV-C light (for sterilization), PlasmaWave/Ionizer (for additional purification, with careful consideration of ozone output).
- **Sensors for Real-time Air Quality Monitoring:**
    - **PM2.5 Sensor:** Crucial for accurate measurement of fine particulate matter, directly addressing a primary pollutant highlighted across the dashboards.
    - **VOC Sensor:** To detect volatile organic compounds and other harmful gases.

    - **Odor Sensor:** To detect and react to unpleasant smells.
    - **Temperature and Humidity Sensor:** For comprehensive environmental monitoring.
- **Smart Connectivity & Control:**
    - **Wi-Fi Connectivity:** For remote control and monitoring via a mobile application.
    - **Mobile Application:**
        - Real-time AQI display (referencing "Bengaluru AQI Status Between March-May 2025" and "Average AQI by Each Day").
        - Historical AQI data.
        - Remote power on/off, fan speed adjustment.
        - Filter life indicator and replacement reminders.
        - Scheduling and timer functions.
        - Push notifications for critical air quality levels.
    - **Voice Assistant Integration:** Compatibility with popular voice assistants (e.g., Google Assistant, Amazon Alexa) for hands-free control. (Inspired by "Smart features" like "App control, smart sensors, Alexa/Google support" in the "Different Brands of Indian Air Purifier with Features" table).
- **Automatic Mode:**
    - Adjust fan speed automatically based on real-time air quality readings. (Aligned with "Auto mode" in the "Different Brands of Indian Air Purifier with Features" table).
- **Quiet Operation:**
    - Low noise levels, especially in sleep mode, to ensure minimal disturbance.
- **Filter Replacement Indicator:**
    - Clear indication when filters need to be replaced, ensuring optimal performance.
- **Sleek Design:**
    - Aesthetics that blend seamlessly with modern home and office environments.

5. Tiered Pricing Models for Target Segments

To cater to various customer needs and budgets, a tiered pricing model will be implemented.

5.1. Entry-Level (Essential Clean Air)

- **Target Segment:** Price-sensitive consumers, first-time air purifier buyers, small rooms/apartments.
- **Key Features:**
    - 3-stage filtration (Pre-filter, HEPA, Activated Carbon).
    - PM2.5 sensor.
    - Basic LED display for AQI.
    - Manual fan speed control.
    - Filter replacement indicator.
- **Pricing Strategy:** Competitive, volume-driven. (Likely in the ₹6,000 - ₹8,000 range, similar to "Blue Star" in the provided data).
- **Value Proposition:** Affordable, effective core air purification.

5.2. Mid-Range (Smart & Connected)

- **Target Segment:** Consumers seeking convenience, smart features, and comprehensive monitoring for medium to large rooms.
- **Key Features (Includes all Entry-Level features plus):**
    - VOC sensor.
    - Wi-Fi connectivity and full-featured mobile app control.
    - Automatic mode based on AQI.
    - Digital display with real-time AQI numbers.
    - Sleep mode with ultra-quiet operation.
    - Child lock.
- **Pricing Strategy:** Value-driven, appealing to the broader market. (Likely in the ₹8,000 - ₹15,000 range, similar to "Dyson," "Honeywell," "MI Xiaomi," "Philips" in the provided data).
- **Value Proposition:** Smart, convenient, and comprehensive air quality management.

5.3. Premium (Elite Performance & Wellness)

- **Target Segment:** Health-conscious individuals, families with specific health concerns (e.g., allergies, asthma), users desiring the most advanced features and maximum coverage for larger spaces.
- **Key Features (Includes all Mid-Range features plus):**
    - 5-stage filtration (Pre-filter, HEPA, Activated Carbon, UV-C Light, Ionizer/PlasmaWave with ozone control).
    - Odor sensor.

    - Advanced air quality insights and personalized recommendations via the app.
    - Integration with smart home ecosystems (e.g., Apple HomeKit, Samsung SmartThings).
    - Larger coverage area (CADR).
    - Premium build materials and design.
    - Longer warranty period.
- **Pricing Strategy:** Premium, targeting a niche market willing to invest in top-tier air quality. (Likely in the ₹18,000 - ₹25,000+ range, similar to "Sharp" in the provided data).
- **Value Proposition:** Ultimate air purification, advanced health protection, seamless smart home integration.

6. Future Enhancements (Post-Launch)

- Integration with local pollution data feeds for predictive insights.
- Machine learning algorithms for personalized purification schedules.
- Integration with wearable health devices to correlate air quality with user well-being.
- Subscription model for filter replacements.

7. Metrics for Success

- Sales volume across different tiers.
- Customer satisfaction ratings.
- Mobile app engagement (daily active users, feature usage).
- Reduction in customer support inquiries related to air quality concerns.
- Positive reviews and testimonials highlighting the effectiveness of the product.