Title Slide

# **Slide 1: Title Slide**

**Title:** OdAR System  
 **Subtitle:** Making the Invisible Visible

**Company Logo:** (Insert OdAR logo)

**Presenter Information:**

* Name: Mat Riexinger
* Role: Project Lead & Founder
* Contact Information: [Your Email] | [Your Phone Number]
* Date: (Presentation Date)

**Visual Guidance:**

* Include high-quality OdAR logo.
* Minimalistic, professional, visually appealing slide layout.

Vision & Mission

# **Slide 2: Vision & Mission**

## **Vision**

OdAR envisions a future where invisible environmental threats are instantly visible and understandable, empowering industries to proactively manage risk and sustainably optimize their operations.

## **Mission**

To provide the most advanced and precise olfactory detection and spatial ranging technology available, delivering real-time, actionable environmental data to industries such as agriculture, healthcare, safety, and industrial monitoring. OdAR commits to:

* Achieving greater than 90% detection accuracy.
* Delivering rapid detection with response times under 1 second.
* Ensuring consistent reliability through intelligent adaptive systems.
* Protecting innovations through comprehensive patent applications.

Problem Statement

# **Slide 3: Problem Statement**

## **Core Problems Addressed by OdAR:**

### **1. Limited Accuracy and Sensitivity**

* Existing olfactory sensing systems often lack the sensitivity required to detect harmful or critical volatile compounds at trace concentrations (parts-per-billion).

### **2. Lack of Spatial Awareness**

* Traditional sensors usually cannot identify the spatial location of odor sources, making it difficult to quickly pinpoint sources of hazardous emissions or leaks.

### **3. Slow Response Times**

* Current sensor technologies often require several seconds to minutes to identify and report odors, delaying critical decision-making.

### **4. High Costs and Complexity**

* Many existing solutions are expensive, bulky, and require specialized knowledge for deployment and maintenance, limiting widespread adoption and practical utility.

### **5. Poor Adaptability**

* Conventional sensors struggle to maintain accurate performance across varying environmental conditions such as temperature and humidity fluctuations, reducing reliability and usability in real-world scenarios.

Unique Selling Proposition (USP)

## **Slide 4: Unique Selling Proposition (USP)**

### **OdAR’s Core Innovations:**

**1. 360° Spatial Precision**

* Ultrasonic sensors accurately map the surrounding area with ±2 cm accuracy.
* Provides full 360-degree spatial awareness, significantly outperforming directional or limited-range systems.

**2. Ultra-Sensitive Olfactory Detection**

* State-of-the-art sensor array combining Metal Oxide Semiconductor (MOS) and Conductive Polymer (CP) sensors.
* Detects volatile organic compounds (VOCs) and hazardous gases at extremely low concentrations (parts-per-billion range).

**3. Adaptive Intelligence**

* Precision PID-controlled temperature cycling, maintaining optimal sensor performance across 10°C to 40°C.
* Real-time adaptive algorithms that enhance accuracy and responsiveness in varying environmental conditions.

**Patent Protection**

* OdAR's innovations are secured through patent-pending technology, ensuring a robust competitive advantage and long-term market defensibility.

**Visual Guidance:**

* Use icons or visuals to represent each technology.
* Clearly emphasize the patent protection visually (e.g., lock icon).
* Maintain clarity, using bullet points and minimal text for easy readability.

Technical Overview & Specifications

## **Slide 5: Technical Overview & Specifications**

### **Hardware**

**Microcontroller:**

* ESP32-WROOM-32E (240 MHz, dual-core)
* Integrated Wi-Fi and Bluetooth (BLE) connectivity

**Sensor Array:**

* Metal Oxide Semiconductor (MOS): SnO₂, ZnO
* Conductive Polymer Sensors (Polyaniline, Polypyrrole)
* Optional: QCM, SAW, optical sensors
* 8-sensor configuration optimized for redundancy and cross-sensitivity

### **Temperature Control System**

* PID-controlled temperature cycling
* Ceramic heater (5V), LM35 temperature sensor
* Operating Range: 10°C–40°C, stability ±1°C

### **Ranging System**

* Ultrasonic ranging (±2 cm accuracy)
* Optional advanced Time-of-Flight (ToF) and low-res LIDAR
* Spatial accuracy: ±10 cm static, ±20 cm dynamic

### **Airflow Regulation**

* Integrated micro-pump for active air sampling
* PWM control for precise airflow management

### **Physical & Connectivity**

* Microcontroller: ESP32-WROOM-32E (Wi-Fi & Bluetooth)
* Display: 0.96-inch OLED
* Enclosure: Polycarbonate, IP65-rated
* Power: Rechargeable lithium-ion battery (~8-hour runtime, ~5W consumption)

**Visual Guidance:**

* Consider diagrams showing sensor array layout, airflow paths, and ranging sensor placement.
* Include a simple block diagram illustrating data flow (Sensors → Signal Conditioning → Microcontroller → AI Model → User Interface).
* Highlight key technical specs clearly on the slide.

Market Opportunity & Competitive Advantage

## **Slide 6: Market Opportunity & Competitive Advantage**

### **Market Size & Growth**

* **Current Market**: USD 1.2 billion (2023)
* **Projected Market Size:** Up to USD 5.75 billion by 2032
* **Growth Rate:** 16.8%–33.5% CAGR

### **Key Market Drivers:**

* Increased environmental and safety regulatory requirements.
* Growing demand for real-time monitoring and IoT integration.
* Expanding use-cases in healthcare diagnostics, agriculture, and industrial safety.

### **Competitive Advantages of OdAR:**

* **Superior Sensitivity & Speed**: Detects chemical compounds at ppb levels within <1 second, outperforming competitors.
* **Integrated Spatial Awareness**: Unparalleled 360° spatial ranging with ±2cm accuracy, not available in traditional electronic noses.
* **Adaptability & Reliability**: Real-time adaptive temperature control and robust IP65 enclosure for consistent accuracy in diverse environments.
* **Patent-Protection**: Patent-pending technology ensures market exclusivity and defensibility.

### **Financial and Strategic Impact:**

* Significant potential cost savings (up to 30% operational cost reduction).
* Anticipated rapid return on investment (ROI: 100-150% within 2–3 years).

**Visual Guidance:**

* Include a clear market growth graph showing rapid CAGR.
* Highlight competitive advantages visually (icons or comparative table).
* Reinforce patent protection visually to emphasize long-term defensibility.

Validation & Performance Metrics

## **Slide 7: Validation & Performance Metrics**

### **Detection Performance**

* **Accuracy:** >90% classification accuracy for target chemical compounds
* **Sensitivity:** Detection capabilities at parts-per-billion (ppb) concentration levels
* **Response Time:** <1 second from exposure to detection and identification

### **Spatial Ranging Performance**

* **Static Accuracy:** ±2 cm accuracy at distances up to 4 meters
* **Dynamic Tracking Accuracy:** ±20 cm for moving sources up to 0.5 m/s
* **Angular Resolution:** ±15° directional accuracy

### **Adaptive Intelligence & Robustness**

* **Temperature Control:** PID algorithm maintains sensor accuracy across 10°C–40°C
* **Humidity Range:** Robust performance within 20%–80% humidity
* **Battery Performance:** ~8-hour continuous operation

### **Real-world Validation**

* Extensive field-testing demonstrating robust performance in simulated industrial environments and outdoor conditions
* Successful discrimination and localization of multiple simultaneous odor sources

**Visual Guidance:**

* Graphs or charts clearly displaying accuracy and response time.
* Visualization of spatial accuracy and sensor coverage.
* Comparative visuals showing OdAR performance against industry standards or competitor benchmarks.

Business Model & Revenue Streams

## **Slide 8: Business Model & Revenue Streams**

### **Business Model Overview**

OdAR leverages multiple revenue streams tailored to maximize market penetration and recurring revenue:

### **Primary Revenue Streams**

1. **Direct Hardware Sales:**
   * Initial revenue through direct sales of OdAR hardware units to target industries (industrial safety, agriculture, healthcare).
   * Competitive pricing with expected profit margins of approximately 50-60%.
2. **Subscription-based Analytics:**
   * Recurring revenue through subscription-based advanced data analytics and monitoring services.
   * Monthly/yearly subscription models provide consistent income and customer retention.
3. **Custom Integration & Consulting:**
   * Customized OdAR installations and integrations for specialized industrial or research applications.
   * Professional consulting for large-scale or complex deployments.
4. **Licensing Opportunities:**
   * Licensing of patented technology to strategic partners or OEMs for sector-specific applications.

### **Financial Impact**

* **Cost Reduction:** Operational cost savings of up to 30% compared to traditional systems.
* **Return on Investment:** Projected ROI of 100-150% within 2–3 years of deployment.

**Visual Guidance:**

* Use visuals to clearly separate revenue streams (icons, diagrams).
* Emphasize recurring revenue streams like subscriptions and licensing.
* Highlight potential market shares and revenue growth visually (simple projection graph).

Expert Team Overview

## **Slide 9: Expert Team Overview**

### **Core Team Members**

### **Dr. Anya Sharma – Olfactory Sensor Technology**

* **Expertise:** Chemical Engineering, specialized in electronic nose (e-nose) development
* **Experience:** 15+ years designing advanced olfactory sensing systems and gas detection methods
* **Role:** Leading sensor technology development, ensuring robust detection accuracy and reliability

### **Dr. Ben Carter**

* **Expertise:** Machine Learning & Algorithm Development
* **Qualifications:** PhD in Computer Science (Machine Learning specialization)
* **Experience:** 10+ years developing algorithms for sensor fusion, pattern recognition, and real-time data analytics
* **Role:** Developing adaptive AI algorithms, ensuring real-time, accurate data interpretation, and effective integration of sensor data

### **Dr. Chloe Davis**

* **Expertise:** Material Science & Nanotechnology
* **Qualifications:** PhD in Materials Science, specialist in nanomaterials for sensor applications
* **Experience:** Extensive background in developing sensor materials to maximize sensitivity, selectivity, and durability
* **Role:** Optimizing sensor material performance and longevity

### **Mr. David Evans**

* **Expertise:** Mechanical Engineering & Hardware Integration
* **Qualifications:** MS Mechanical Engineering
* **Experience:** 8+ years in precision tool and enclosure design for electronic devices
* **Role:** Designing the robust, user-friendly, and IP65-rated enclosure, managing physical hardware integration, and ensuring manufacturability and scalability

**Visual Guidance:**

* Include professional headshots or simple graphical icons for each member.
* Briefly highlight each member's strongest credentials or past achievements visually.
* Display the team structure clearly to emphasize collaboration and integrated roles.

Project Roadmap & Timeline

## **Slide 10: Project Roadmap & Timeline**

### **Six-Month Development Timeline**

#### **Months 1–2: Hardware Development**

* Finalize sensor array (MOS and Conductive Polymer)
* Integrate ultrasonic/ToF ranging sensors
* Complete PCB design (integrated sensor, ranging, and airflow systems)
* Initial prototyping and preliminary component testing

#### **Months 2–3: Data Collection & Calibration**

* Conduct baseline and controlled compound exposure data collection
* Calibrate sensors for accurate odor detection and spatial localization
* Implement airflow regulation (micro-pump) for enhanced sensitivity

#### **Months 3–4: AI Algorithm Development**

* Develop and train adaptive detection algorithms (PCA, SVM, CNN-LSTM)
* Create spatial mapping and sensor fusion models
* Implement real-time adaptive temperature and airflow control algorithms

#### **Months 4–5: System Integration**

* Integration and testing of all hardware and software components
* Initial dynamic and static performance validation
* Optimization of combined sensor-ranges and airflow functionalities

#### **Months 5–6: Comprehensive Testing & Documentation**

* Extensive validation under controlled and real-world scenarios
* Final adjustments based on validation results
* Complete documentation and patent filing

### **Key Milestones**

* **Month 2**: Fully functional hardware prototype
* **Month 4**: Completion of software and algorithm optimization
* **Month 5**: Integrated system validation and optimization
* **Month 6**: Patent application submission and market-ready system

**Visual Guidance:**

* Create a clear visual timeline (Gantt chart format) showing major phases and milestones.
* Emphasize critical milestones visually to underscore progress and readiness.
* Clearly highlight patent submission milestone to reinforce market protection and strategic importance.

Opportunity Investment

## **Slide 11: Investment Opportunity**

### **Funding Needs**

* **Total Capital Required:** $275,000

### **Funding Allocation**

* **Hardware Development:** $85,000  
  + Sensor array integration and PCB design: $40,000
  + Ranging and airflow systems: $15,000
  + Testing and calibration equipment: $30,000
* **Software & Algorithm Development:** $90,000  
  + AI and adaptive algorithms: $50,000
  + Spatial mapping and sensor fusion: $25,000
  + Real-time data analytics platform: $15,000
* **Expert Consulting:** $75,000  
  + Olfactory technology experts
  + Material science and hardware specialists
  + IP and patent experts
* **Patent Filing & Documentation:** $25,000  
  + Comprehensive patent filing and legal fees
  + Detailed technical documentation

### **Anticipated Financial Impact**

* **Projected Cost Savings for Clients:** Up to 30% operational cost reduction
* **Return on Investment (ROI):** Anticipated 100-150% within 2–3 years
* **Long-term Market Opportunity:** Accessing a rapidly growing market (CAGR 16.8%–33.5%)

**Visual Guidance:**

* Include pie chart or bar graph clearly breaking down budget allocation.
* Highlight ROI visually with clear metrics.
* Emphasize the compelling market growth potential visually (growth projections or market share visuals).