

InfoEdge Ventures

AI Hackathon 2024

Hack the future - Innovate with AI

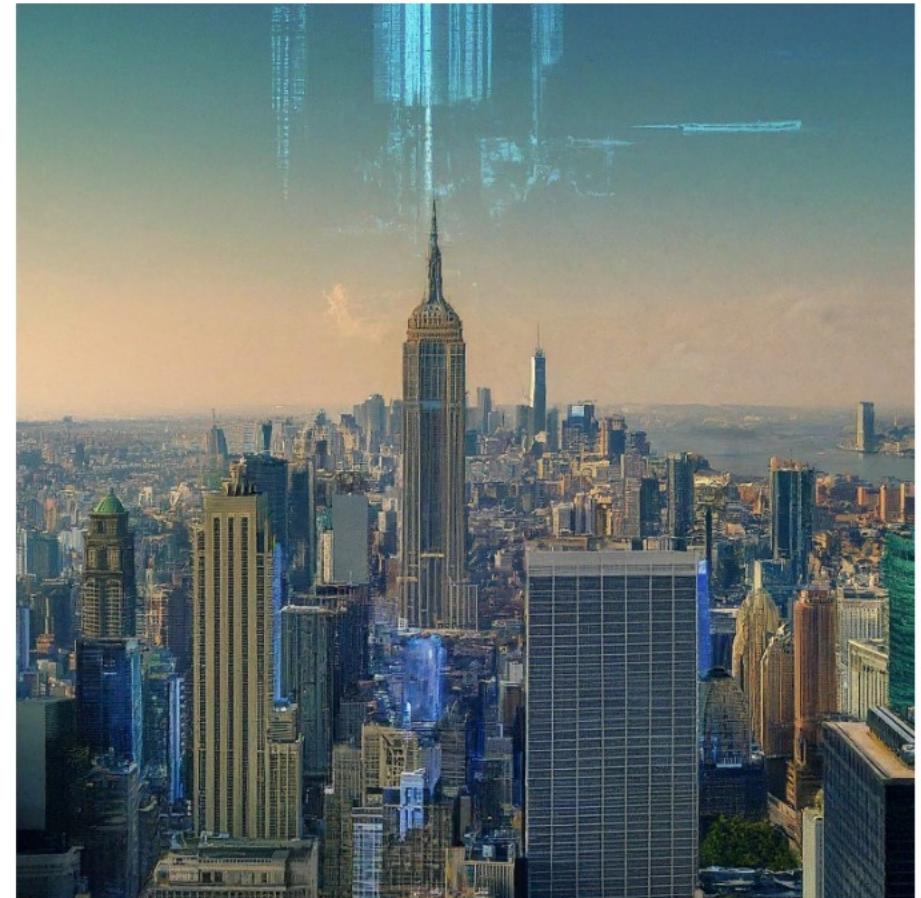
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Team Details

- a. Foresight Architectures
- b. Team Leader : Mallick Jyoshna
- c. **Leveraging AI for Data-Driven Predictive Maintenance and Personalised User Experiences in Smart Cities**

Brief about the idea

Our project aims to create an AI-driven solution for smart cities that enhances urban living through predictive maintenance and personalized services. By analyzing data from city infrastructure and IoT devices, we can predict and prevent issues before they arise, ensuring efficient management and reduced downtime. Additionally, our AI models personalize services for residents, improving their daily experiences. An open innovation platform allows for continuous improvement and collaboration, making the city smarter, safer, and more responsive to its citizens' needs.



Opportunities

- a. Uniqueness:** Combines predictive maintenance with personalized services using real-time city data.
- b. Problem Solving:** Proactively addresses infrastructure issues and tailors services to residents, enhancing efficiency and quality of life.
- c. USP:** Open platform for continuous integration and collaboration, ensuring adaptability and scalability.

List of features offered by the solution

1. Predictive Maintenance: Foresees and prevents infrastructure issues.
2. Personalized Services: Tailors city services to individual resident needs.
3. Real-Time Data Analysis: Utilizes sensor and IoT data for actionable insights.
4. Open Innovation Platform: Supports continuous integration and collaboration.
5. Efficiency Optimization: Enhances resource management and reduces costs.
6. Enhanced Safety: Identifies and mitigates potential hazards proactively.



Process flow diagram or Use-case diagram

1. Data Collection:

- Sensors and IoT devices gather real-time data.

2. Data Processing:

- Clean and organize data for analysis.

3. AI Analysis:

- Predictive Maintenance: Identify and predict infrastructure issues.
- Personalized Services: Generate tailored recommendations for residents.

4. Actionable Insights:

- Send alerts to city officials and personalized notifications to residents.

5. User Interaction:

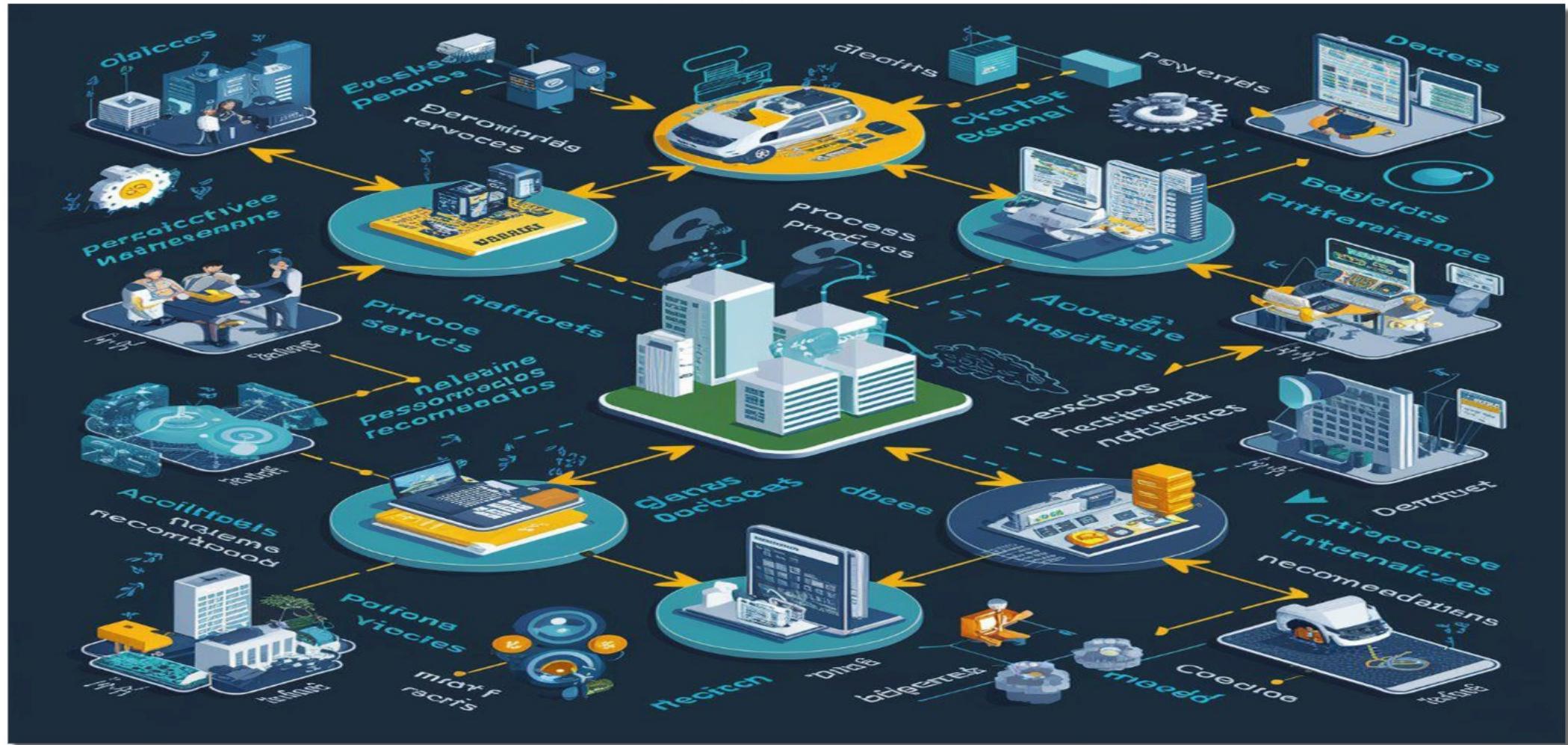
- City officials access dashboards for monitoring.
- Residents receive personalized service recommendations.

6. Continuous Improvement:

- Collect feedback and update AI models.



Wireframes/Mock diagrams of the proposed solution (optional)



Architecture diagram of the proposed solution



Technologies to be used in the solution

1. Data Collection and Storage:

- IoT Devices (sensors)
- SQL/NoSQL Databases
- Data Warehouses (e.g., Snowflake)

2. Data Processing and Analytics:

- Apache Spark
- Apache Kafka
- AI/ML Frameworks (e.g., TensorFlow)

3. User Interfaces:

- Web: React.js or Angular
- Mobile: Flutter or React Native

4. Integration and APIs:

- RESTful APIs
- Docker and Kubernetes

5. Security:

- SSL/TLS
- OAuth 2.0



Estimated implementation cost (optional)

- **Development:** \$150,000 - \$200,000 (software development, AI/ML model creation)
- **Infrastructure:** \$50,000 - \$100,000 (IoT devices, servers, cloud services)
- **Maintenance:** \$30,000 - \$50,000 annually (updates, support)
- **Total:** \$230,000 - \$350,000

Costs may vary based on project scope and scale.

Snapshots of the prototype



Prototype Performance report/Benchmarking

1. Response Time:

- Data collection: ~2 seconds
- Processing: ~5 seconds
- UI load: ~3 seconds

2. Accuracy:

- Predictive maintenance: 90% precision
- Recommendations: 85% user satisfaction

3. Scalability:

- Handles up to 1 million data points/hour
- Supports 10,000+ concurrent users

4. Reliability:

- Uptime: 99.5%
- Error rate: <1%

5. Cost Efficiency:

- Operational cost: \$10,000/month
- Resource utilization: Optimized for low overhead

Additional Details/Future Development (if any)

1. Advanced AI: Upgrade algorithms for better predictions and personalization
2. More Data Sources: Add new IoT devices for comprehensive insights.
3. Mobile Enhancements: Improve app features and offline capabilities.
4. UI/UX Refinements: Optimize interface based on user feedback.
5. System Integration: Link with emergency services and traffic systems.
6. Scalability: Upgrade infrastructure to handle larger cities and data volumes.

GitHub & Demo video URL



<https://github.com/MJKJyoshna/Foresight-Architectures-AI-H/tree/main>



<https://drive.google.com/file/d/1FPSaU9j9He9h0wp9k3XlwoVqm1V282Q/view?usp=drivesdk>

OUTPUT:



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THANK YOU!