Business Profile: Gearbox Housing Inc.

1. Company Overview

- **Name**: Gearbox Housing Inc.
- **Industry**: Automotive Manufacturing
- **Established**: 1985
- **Headquarters**: Detroit, Michigan, USA
- **Products**: High-performance gearbox housings for automobiles, including heavy-duty and electric vehicles.
- **Size**:
    - Employees: 1,200
    - Facilities: 3 manufacturing plants in the USA (Detroit, Kansas City, Atlanta)
- **Annual Revenue**: $250 million (2024)
- **Key Clients**:
    - Major automotive OEMs like Ford, GM, Tesla, and Toyota.
- **Market Position**:
    - Known for durability and precision in gearbox housings.
    - Facing increased competition from low-cost manufacturers in Asia.

2. Current Manufacturing Process

- **Manufacturing Approach**:
    - Batch manufacturing with a mix of manual and semi-automated processes.
    - High reliance on legacy equipment.
- **Key Metrics**:
    - **Current Efficiency**: 72% (measured as Overall Equipment Effectiveness, OEE).
    - **Defect Rate**: 8% of output requires rework or scrapping.
    - **Downtime**: Average 15% downtime due to machine maintenance and unplanned stops.
    - **Production Volume**: 100,000 units/month across all plants.
- **Challenges**:
    - High variability in quality due to manual inspections.
    - Delays caused by unplanned machine downtime.
    - Inefficient use of raw materials leading to higher production costs.

3. Strategic Goals

- Improve production efficiency by integrating **Industry 4.0** concepts.
- Achieve **25% improvement** in efficiency by reducing downtime and optimizing workflows.
- Reduce defect rate from **8% to 5%** by implementing automated quality checks.
- Enhance real-time production visibility to improve decision-making and meet delivery timelines.

4. Competitive Landscape

- **Competitors**:
    - Global competitors like ZF Friedrichshafen, Magna International, and local players in precision manufacturing.
- **Competitive Pressure**:
    - Need to lower costs to stay competitive in the global market.
    - Increasing client demand for traceability and quality assurance in supply chains.

5. Opportunities with Smart Factory Implementation

- **IoT Integration**:
    - Real-time data collection and monitoring for predictive maintenance.
    - Automation of manual quality inspections.
- **Advanced Analytics**:
    - Use AI/ML for defect pattern analysis and optimization of production schedules.
- **Sustainability**:
    - Reduce waste and energy consumption with real-time monitoring.

6. Financials Relevant to Project

- **Current Costs**:
    - Labor: $60 million/year
    - Maintenance: $15 million/year
    - Material Waste Costs: $10 million/year
- **Potential Savings**:
    - Reduce downtime by 20%, saving approximately $3 million/year.
    - Reduce defects by 15%, saving $1.5 million/year on rework and scrap.
- **Proposed Investment**:

- Initial Investment for Smart Factory: $10 million.
- ROI Target: Payback period of 2-3 years through savings and efficiency gains.

7. Project Stakeholders

- **Internal Stakeholders**:
  - CEO & Executive Board: Strategic alignment and ROI focus.
  - Operations Manager: Overseeing plant improvements.
  - Quality Assurance Team: Ensuring defect reduction goals.
  - IT Team: Supporting IoT integration and data management.
- **External Stakeholders**:
  - Automotive OEM Clients: Expecting higher quality and transparency.
  - Technology Vendors: IoT device suppliers and system integrators.
  - Investors: Interested in cost reduction and competitive positioning.

8. Risks and Challenges

- **Integration Risks**:
  - Compatibility issues with legacy systems.
  - Potential resistance from the workforce to adopt new technologies.

- **Financial Risks**:
    - Initial capital outlay and unforeseen costs.
- **Operational Risks**:
    - Temporary disruptions during the pilot and implementation phases.

9. Supporting Metrics for Business Case

- **Key Performance Indicators**:
    - OEE improvement from 72% to 90%.
    - Defect reduction from 8% to 5%.
    - 20% reduction in downtime across facilities.
    - $4.5 million annual savings post-implementation.

10. Vision Statement

"To become a leader in advanced manufacturing for automotive components by leveraging Industry 4.0 innovations to deliver superior quality, reduce costs, and improve efficiency."