1. Data Acquisition and Integration

- **Sensor interface software:** To collect data from sensors (e.g., strain gauges, accelerometers, displacement sensors).

- **Real-time data acquisition tools:** For streaming and recording sensor data (e.g., NI LabVIEW, MATLAB Data Acquisition Toolbox).

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2. Data Processing and Analysis

- **Signal processing software:** For filtering, denoising, and transforming signals (e.g., FFT, wavelet transforms).

- **Statistical analysis tools:** To detect anomalies or trends in data (e.g., MATLAB, R, Python with SciPy/pandas).

- **Machine learning libraries** (optional): For pattern recognition or predictive maintenance (e.g., TensorFlow, PyTorch, Scikit-learn).

3. Visualization and Reporting

- **Graphical visualization tools**: To display sensor data over time, spatial layouts, or animations (e.g., MATLAB, Python matplotlib/Plotly, GIS software).

- **Dashboards**: For live monitoring and alerts (e.g., Grafana, custom web apps).

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4. Data Management

- **Database systems**: To store large amounts of monitoring data (e.g., SQL, PostgreSQL, NoSQL databases like MongoDB).

- **Cloud integration** (optional): For remote access and storage scalability (e.g., AWS, Azure, Google Cloud).

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5. Finite Element Analysis (FEA) Tools

- **FEA software**: For comparing measured responses with model predictions (e.g., ANSYS, ABAQUS, SAP2000).