

YOUNG PROFESSIONAL ADVISORY COMMITTEE SESSION: AI AND SUSTAINABILITY IN CONSTRUCTION

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THE VOICE OF THE INSULATION INDUSTRY™

Presenter



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Agenda

- Introduction
- Optimizing Material Usage
- Revolutionizing Recycling
- Predicting Building Maintenance Needs
- Responsible AI Implementation
- Avoiding Common Mistakes
- Minimizing Risk



Introduction

Significance of Sustainability in Construction:

- Growing environmental concerns
- Need for eco-friendly building practices
- Impact on long-term industry viability

Role of AI in Driving Sustainable Practices:

- AI's ability to analyze vast amounts of data
- Enhancing efficiency and reducing waste
- Predictive capabilities for proactive measures

Optimizing Material Usage

AI Analysis for Material Requirements:

- Utilizes project specifications and historical data
- Prevents over-ordering and minimizes waste

• Efficient Resource Allocation with Internet of Things (“IOT”):

- Monitors material flow in real-time
- Ensures optimal usage and reduces excess
- Lead times and supply chain issues

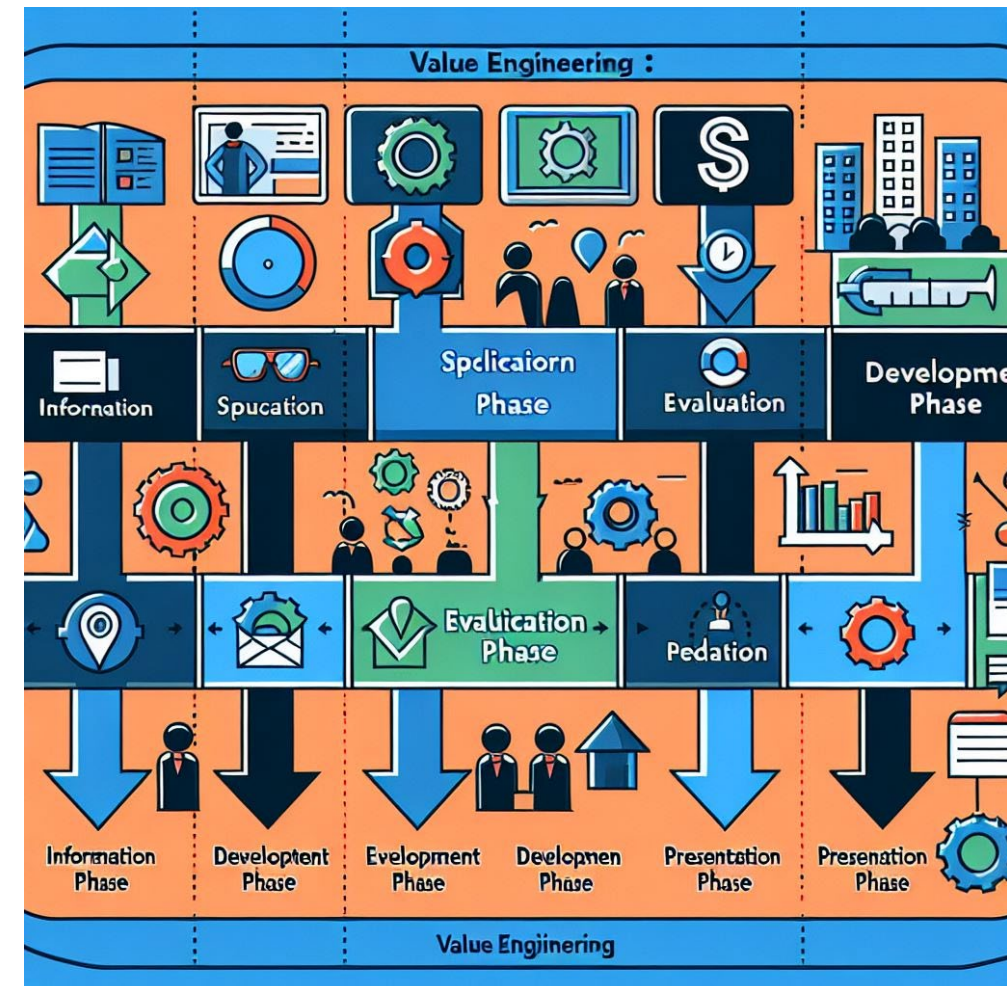
Optimizing Material Usage – IOT Examples

- Smart Sensors for Equipment Monitoring
- Wearable Health Trackers
- GPS Trackers for Tools and Equipment
- Environmental Sensors
- Structural Health Monitoring Systems
- Augmented Reality (AR Devices)



Optimizing Material Usage – Value Engineering

- Optimization of Design for Cost Efficiency
- Aligns the Project with Overall Budget
- Enhances Material Selection
- Improves Project Scheduling
- Streamlines Resource Allocation
- Prepares the Project Execution Plan



Revolutionizing Recycling

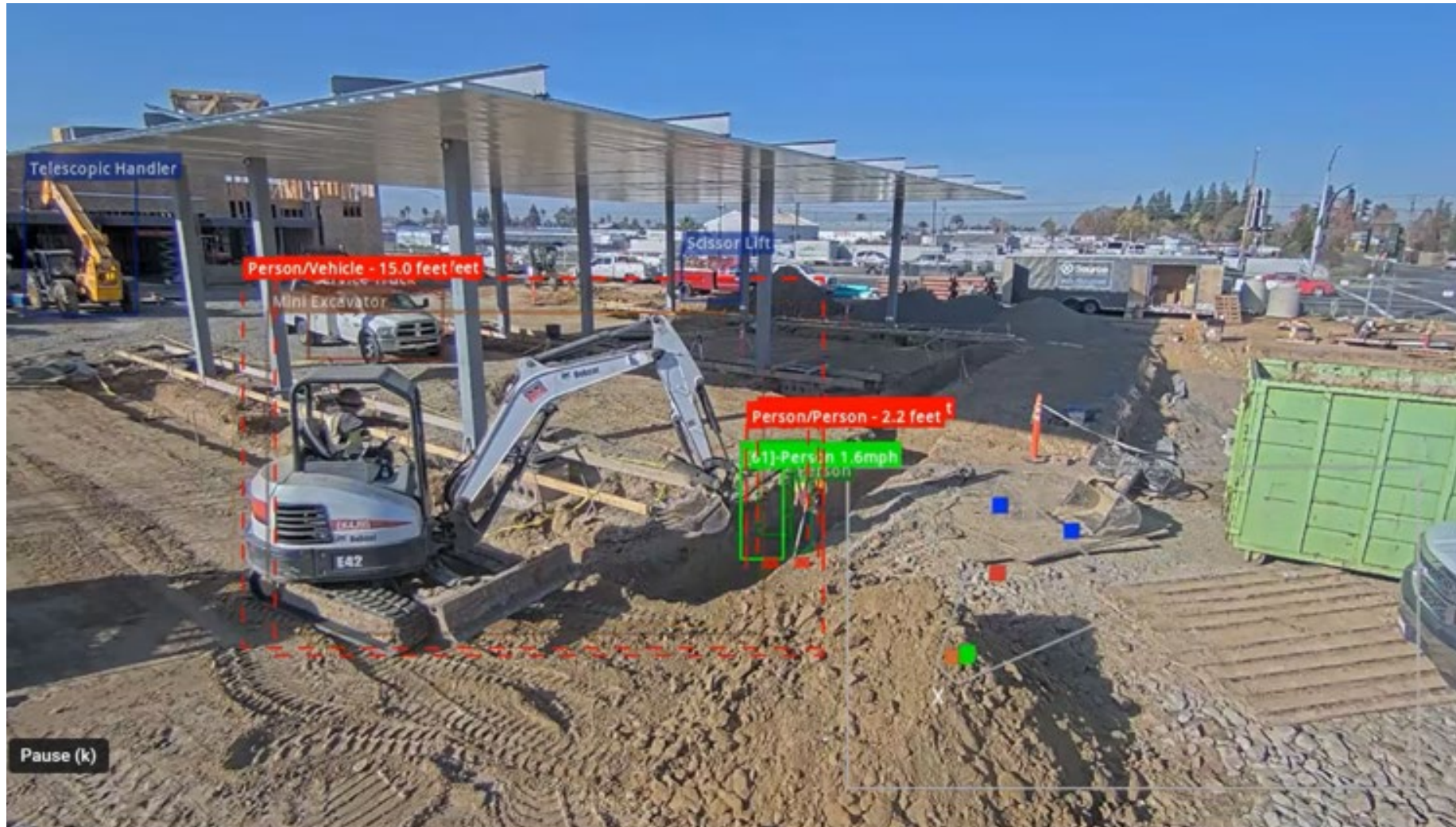
AI-Enhanced Recycling Processes:

- Identifies and categorizes construction waste (e.g., image recognition)
- Improves sorting efficiency and reduces contamination

Predictive Analytics for Waste Management:

- Plans recycling efforts more effectively
- Optimizes resource recovery and minimizes landfill use

Revolutionizing Recycling



EarthCam, Inc.

Environment Sensors

Monitoring Pollution and Air Quality

- Detects airborne dust and pollutants
- Ensures compliance with environmental regulations

Temperature and Humidity Sensors

- Monitors environmental conditions affecting material integrity
- Provides data for optimal construction practices

Particulate Matter Sensors

- Measures levels of particulate matter in the air
- Helps in maintaining a safe and healthy worksite



Structural Health Monitoring Systems

Real-Time Monitoring

- Uses geodetic sensors and Global Navigation Satellite Systems (GNSS) solutions
- Detects structural movements with high precision

Early Warning Systems

- Identifies critical and warning signs
- Prevents sudden failures and accidents

Long-Term Cost Reduction

- Reduces maintenance costs
- Plans maintenance programs based on future behavior

Impact Assessment

- Evaluates effects of natural calamities
- Protects nearby areas and structures

What Are the Challenges?

High Resource Utilization

- Significant computational power leads to high energy consumption and carbon emissions.

Creation of E-Waste

- Rapid development of AI technologies contributes to electronic waste.

Bias and Transparency Issues

- AI systems can perpetuate biases and lack transparency.

Complex Sustainability Assessments

- Difficult to evaluate the environmental impact due to complex supply chains.

What Are the Challenges? (cont.)

We Are Not Ready!

- Timeline of construction for data centers and infrastructure.

Implementation Costs

- High cost of integrating AI technologies.

Workforce Adaptation

- Need for specialized training for workers.

Ethical Considerations

- Ensuring AI applications do not compromise worker safety or lead to job displacement.

What Are the Challenges? (cont.)

Data Integration

- Comprehensive data integration from various sources is technically demanding.

Predictive Maintenance

- Requires accurate and timely data for effective functioning.

Regulatory Compliance

- Ensuring AI systems comply with evolving environmental regulations.

What Are the Challenges? (cont.)

Blind Use of AI

- AI Can Hallucinate!
- Inaccurate Data
- Safety Risks
- Resource Misallocation
- Regulatory Compliance
- Trust and Adoption



Questions?

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