

Digital Twin: The Future of the EHS Profession

Practical Applications for
EHS Practitioners



Speaker Intro

Chet Brandon, CSP, CHMM

- 30+ years of EHS leadership across heavy industry
- Global experience driving safety performance and culture transformation
- Developer of innovative EHS systems and digital safety solutions
- Active leader in ASSP and contributor to BCSP professional development
- Focused on advancing EHS through AI, sustainability, and digital transformation

www.LeadingEHS.com

ASSP Voluntarism



Central Indiana Chapter President



Region VII Vice President



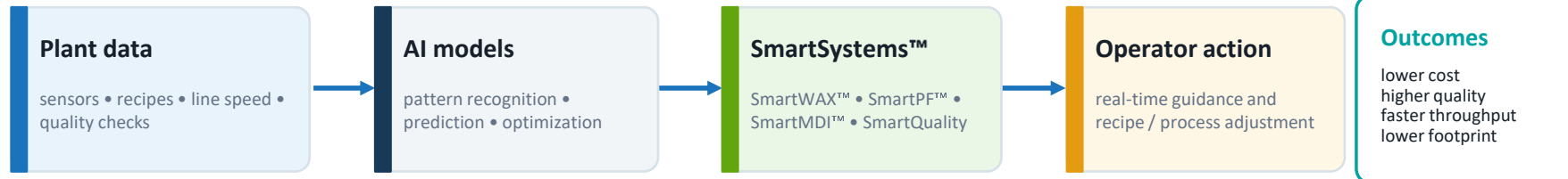
Nominations and Elections Committee Member



Executive Safety Forum Leader Representative

From adhesive chemistry to autonomous manufacturing intelligence

Integrating Hexion’s resin expertise with Smartech AI creates a closed-loop operating model for engineered wood panels—optimizing resin use, quality, speed, and sustainability in real time.



Strategic signal

Move from material supplier to AI-enabled manufacturing partner

Advanced AI use cases enabled by integration

- **Predictive quality** Real-time view of board quality to reduce rework and optimize line decisions.
- **Autonomous resin control** AI-tuned application for MDI, PF and wax to improve coverage and reactivity.
- **Sustainability intelligence** Material, waste and emissions improvements tied directly to operating parameters.
- **Fleet learning** Insights from one mill become transferable operating knowledge across lines and sites.

Executive takeaway

Smartech turns resin chemistry into an adaptive manufacturing control system—where every board, line condition and quality signal improves the next decision.

The Journey with My Digital Twin

LeadingEHS.com

Leading is not watching the crowd to see where they are going... Be daringly different for better results.



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← From Hazard to Control: Managing Combustible Dust in Real-World Operations

Stop Work Authority: The Ultimate Expression of Safety, Empowerment, and Respect →

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AI as a Strategic Partner: Building a Digital Twin to Advance Safety and Sustainability

Posted on [August 3, 2025](#) by [Chet Brandon](#)



Introduction

The challenges of leading Environmental, Health, and Safety (EHS) efforts across global, high-risk operations have never been more intense. Executive leaders today are asked to navigate volatile regulations, emerging technologies, ESG mandates, cultural transformation, and shifting workforce expectations—all while maintaining integrity, accountability, and performance.

Why This Matters to You

More data, less time



Higher expectations from leadership



Need to anticipate—not just react



Digital twin = force multiplier for practitioners

What is a Digital Twin (In This Context)



A DIGITAL EXTENSION OF
AN EXPERIENCED EHS
LEADER



BUILT FROM REAL-WORLD
DECISIONS, STANDARDS,
AND LEADERSHIP
BEHAVIORS



APPLIES STRUCTURED
THINKING TO DATA AT
SCALE



PROVIDES CONSISTENT,
REAL-TIME INSIGHT
ACROSS OPERATIONS

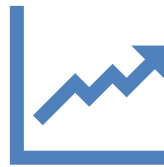


ACTS AS A STRATEGIC
PARTNER—NOT JUST A
TOOL

Shift in the EHS Role



From compliance
manager → risk strategist



From lagging indicators
→ predictive insights



From site focus →
enterprise influence

Where You Feel the Pain Today



Digital Twin Use Case: Incident Analysis

Auto	Identify	Highlight	Suggest
Auto-trend incidents across sites	Identify top recurring failure modes	Highlight systemic issues	Suggest corrective actions aligned to hierarchy of controls

Example Auto Insight Report

Insight

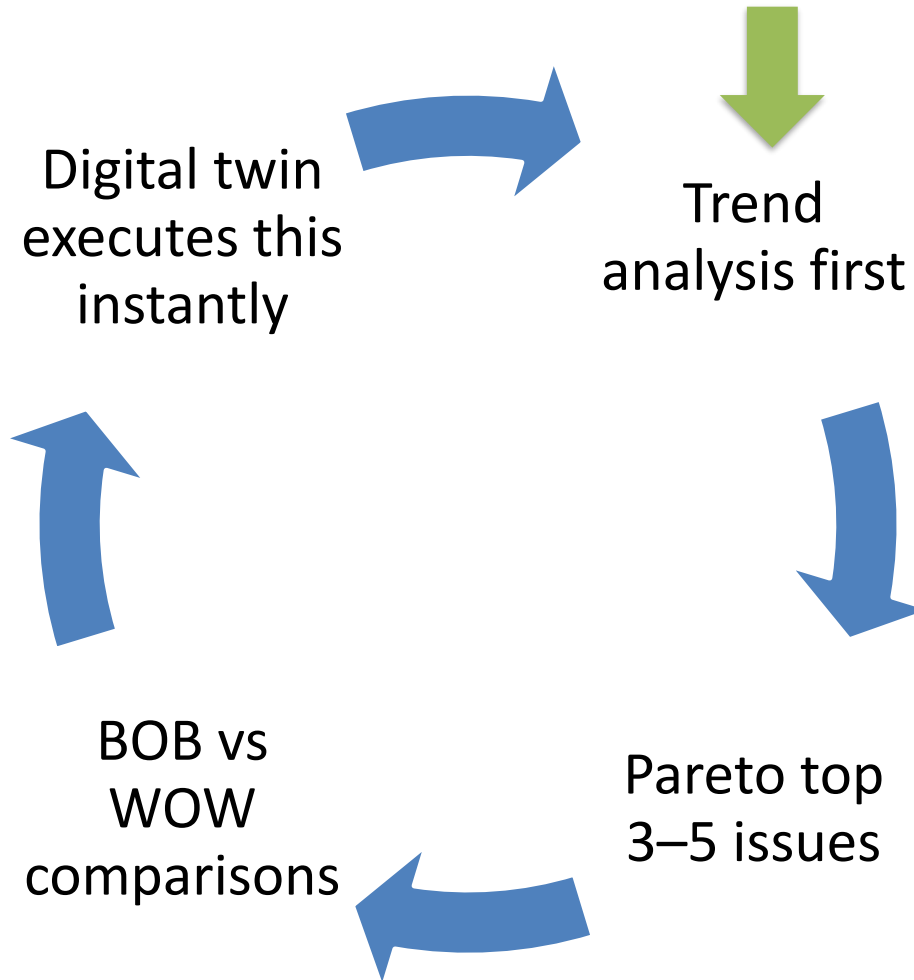
Across reported spill events, the dominant signal is

repeated loss of containment during transfers and at flanges, valves, gaskets, and seals, with most outcomes described as staying within containment. Highest consequence potential clusters around bulk loading/unloading, tank farm, and maintenance/LOTO restoration handoffs.

- **Signal** Frequent events tied to resin and formaldehyde solution; repeated references to dripping/weeping, loose fittings, misalignment, and overfill.
- **Driver** Mechanical integrity weaknesses plus human-factor traps: wrong valve/tank selection, incomplete closure, inadequate verification after maintenance, and reduced line-of-sight during loading.
- **Focus** Tighten controls for transfer authorization, positive verification of valve states, and standardized leak checks after maintenance and before/after loading.

⚠ This content was generated with AI and, while helpful, may contain mistakes — please review carefully.

Applying Your Existing Methods



Use Case: Near Miss & Leading Indicators

01

Identify weak signals early

02

Detect clustering of risk

03

Predict where next injury may occur

04

Prioritize proactive interventions

Big Win: Speed



MINUTES INSTEAD
OF DAYS



FASTER CORRECTIVE
ACTIONS



REDUCED EXPOSURE
TIME TO RISK

Big Win: Consistency

Same issue →
same quality
response

Reduces
variability
between sites

Scales best
practices
globally

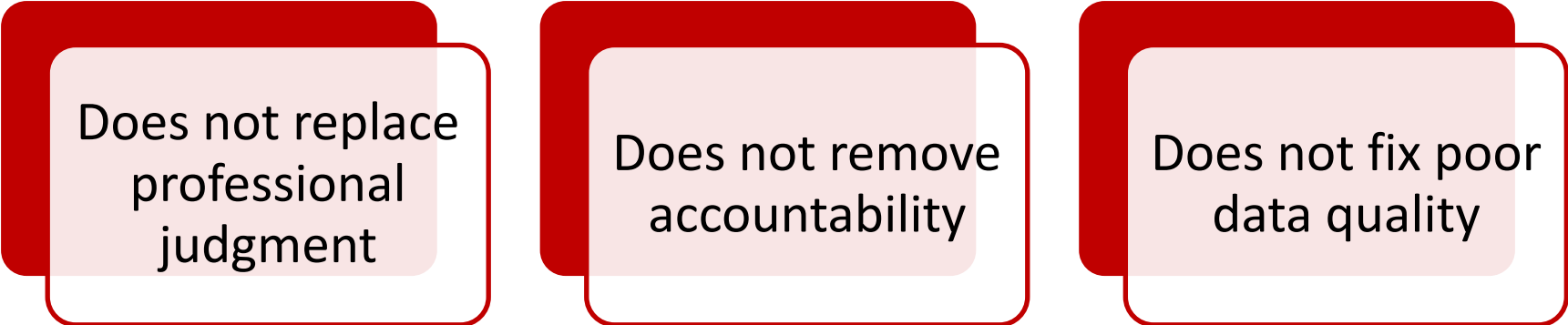
Big Win: Knowledge Retention

Captures experienced practitioner thinking

Prevents loss of expertise

Accelerates development of new professionals

What It Does NOT Do

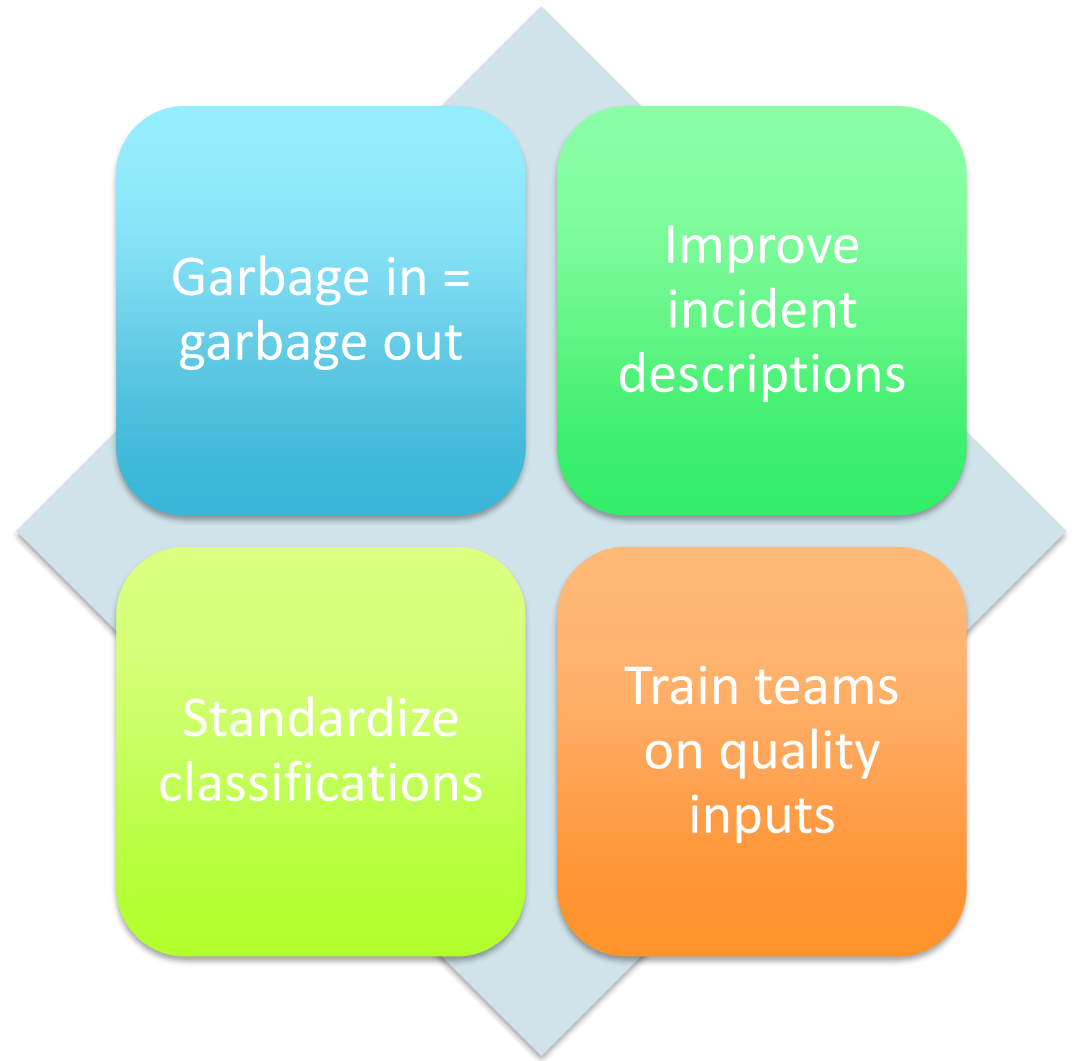


Does not replace
professional
judgment

Does not remove
accountability

Does not fix poor
data quality

Critical Success Factor: Data Quality



Critical
Success
Factor:
Culture

Psychological safety still
required

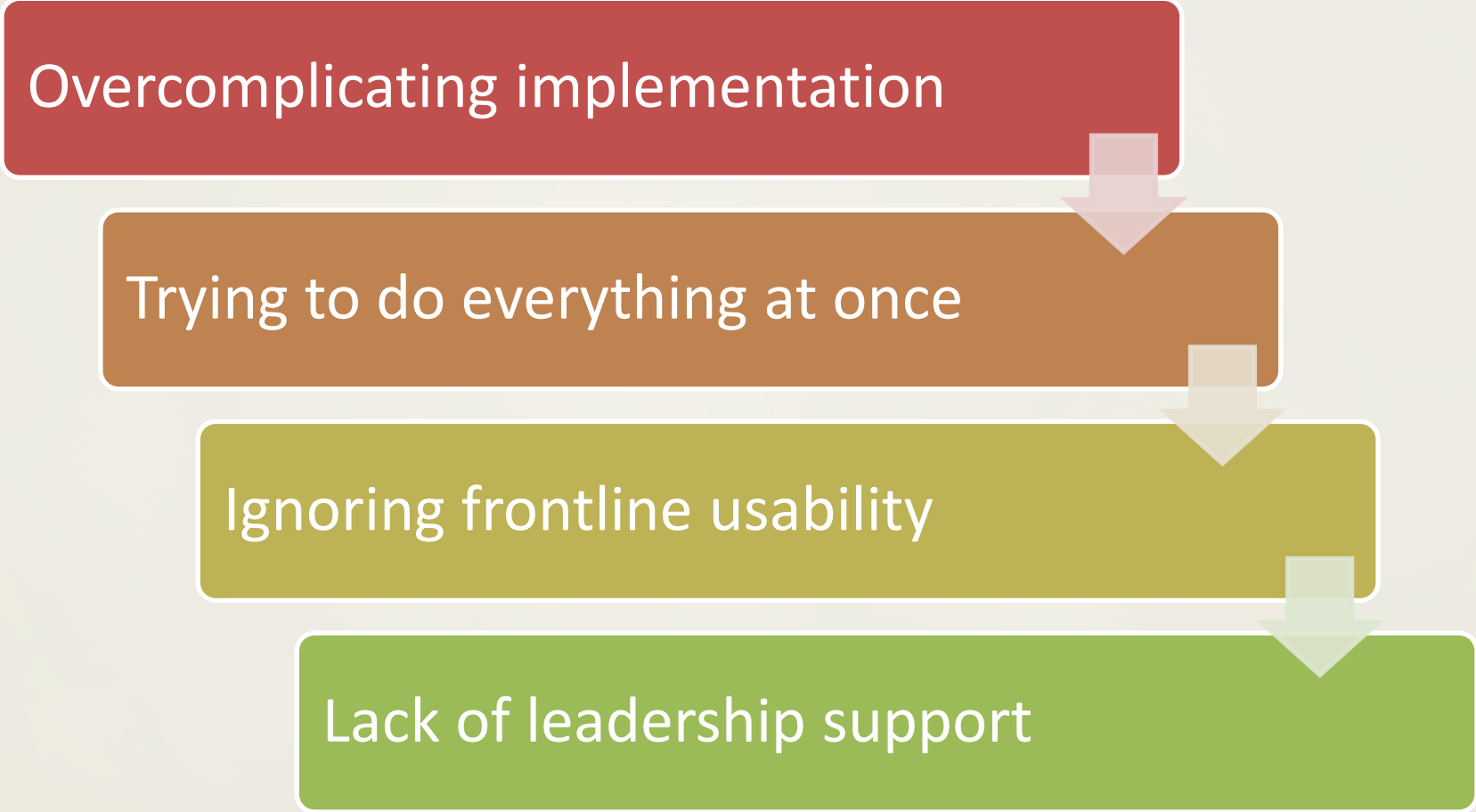
People must report issues

Leaders must act quickly

Technology amplifies
culture—it doesn't replace it

Common Pitfalls

Overcomplicating implementation



```
graph TD; A[Overcomplicating implementation] --> B[Trying to do everything at once]; B --> C[Ignoring frontline usability]; C --> D[Lack of leadership support];
```

Trying to do everything at once

Ignoring frontline usability

Lack of leadership support

Where to Start (Practical)

1

Start with
incident data

2

Focus on 1–2
high-impact use
cases

3

Pilot at 1–2 sites

4

Measure results

Quick Wins You Can Deploy

Incident trend
dashboards

Automated root
cause themes

Audit finding
analysis

Leading indicator
tracking

Future State

Predictive risk
identification

Real-time decision
support

Integrated EHS +
sustainability
insights

Autonomous
recommendations

Your Role as an EHS Practitioner



Own the
system logic



Validate
outputs



Drive action
from insights



Coach the
organization

What is a Digital Twin (Practitioner View)



AI MODEL TRAINED
ON YOUR
DECISIONS



APPLIES YOUR
STANDARDS
CONSISTENTLY



LEARNS FROM
YOUR INCIDENT &
AUDIT DATA



ACTS AS A REAL-
TIME ADVISOR

My Digital Twin



New chat Ctrl + Shift + O

Search chats

Images

Apps

Deep research

Codex

Projects

GPTs

 Chetwin DT Executive Twin

 Signal Safety Twin

 StewardSpark

 PS Director

 Explore GPTs

Recents

45-minute PPT Structure

Safety Performance Gamification

EHS Specialist Hiring Recommen...

Green Cross Safety Innovation

Matrixed Organization Model

Email Improvement Suggestions

CEO Operational Report Summary

Hexion Enterprise

Chetwin DT Executive Twin ▼ Note: The creator recommends GPT-5.2. You are using GPT-5.3.



Chetwin DT Executive Twin

By Chet Brandon 

→ Switch to GPT-5.2 (creator's recommended model)

Strategic and motivational executive twin for EHS, sustainability, governance, and leadership.

Draft a keynote message connecting safety...

Summarize current EHS priorities for a board update.

Create a leadership message for frontline...

Ask a question about Hexion EHS procedures.

+ Ask anything



How This Digital Twin Was Built



30+ years of EHS leadership experience



Codified decision frameworks (trend analysis, Pareto, hierarchy of controls)



Embedded leadership principles and expectations



Trained on real-world scenarios, risks, and operational challenges



Continuously refined through feedback and evolving data



Message from Chetwin DT My Digital Twin



I am built from your experience, your decisions, and your standards.



I see patterns across data that are hard to detect in real time.



I will challenge you when risk is emerging—even if it's uncomfortable.



I help you focus on what matters most: preventing harm.



I do not replace your judgment—I strengthen it.



Together, we move from reacting to predicting.

What Makes This Digital Twin Different

Grounded in
practical EHS
execution—not
theory

Combines
technical rigor
with leadership
judgment

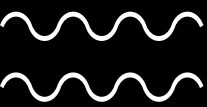
Balances data-
driven insights
with human
factors

Designed for heavy
industry and
complex
operations

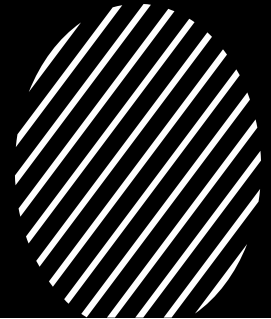
Focused on
prevention, not
just analysis

Digital Twin Model for EHS





Call to Action



1

Start capturing
your decision
logic

2

Improve your
data today

3

Identify one
pilot use case

4

Lead the
change—don't
wait for it

DIGITAL TWIN EHS OPERATING MODEL

Continuous Risk Intelligence for Safer, Smarter Workplaces



Reactive



Predictive



Autonomous

REAL-TIME DATA ECOSYSTEM



Incidents & near misses



Audit & inspection findings
(strong and evehfeding)



Safety observations



Equipment performance



Contractor activities



Environmental metrics



ANALYTICS ENGINE



DATA

Identify trends
& outliers



CAUSATION PRIORITIZATION

Apply Pareto &
hierarchy of controls



INSIGHTS

Identify enticing
solutions



DATA

Identify trends
& outliers

EHS LEADER HEURISTICS

Assess high-energy
& recurring risks



LOGIC

Identify emerges
& solutions



INSIGHTS

Targeted actions
& systemic gaps

LEARNING SYSTEM



ACTION & OUTCOMES



Reduce High-Risk Events

Risk-ranking shield icon



Increase Productivity

Ensuring area poultgation



Enhance Compliance

Quality trains in& learning



Support Sustainability

Health & rosodtices rportmis

Real-Time Decision Support



Automate corrective actions



Align resources to highest risks



Enable continuous improvement



Demonstrate business value

Discussion

Where are
our biggest
pain points?

What data do
we already
have?

What could
we pilot in 90
days?