

GET Lean: The Lean Foundation Of a Digital Factory

GE Transportation, A Wabtec Company



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**Global Lean Leader
Wabtec Corp.**

GET Lean: The Lean Foundation of a Digital Factory

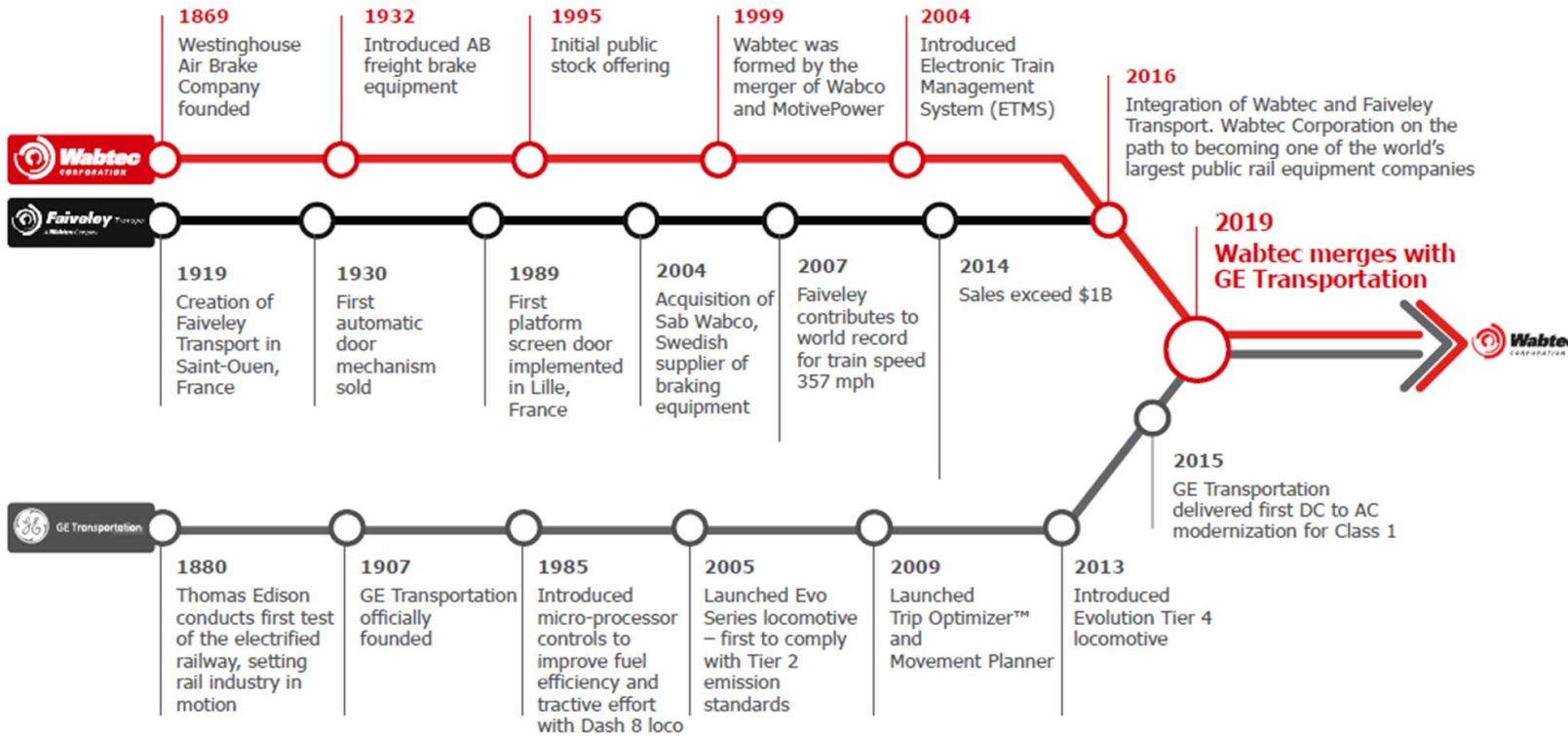
Leading on the Edge

A lean cultural transformation is difficult enough without the complexities that occur when three successful companies merge. But that is exactly what Wabtec Corp. is experiencing, as it has gone from a \$1 Billion company to \$8 Billion in the last 7 years.

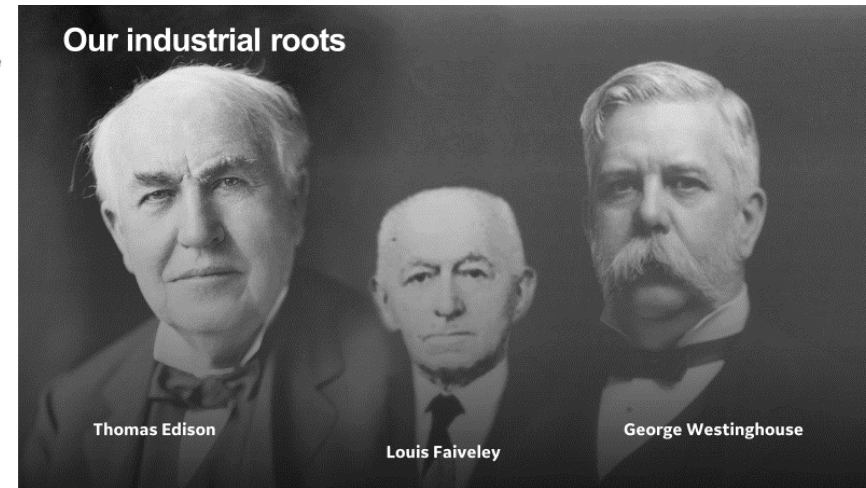
We will discuss the following:

- Brief History of Wabtec, Faiveley, GE Transportations Mergers
- The Wabtec Management System
- 3P and additional Lean Tools Implemented
- Digital Tools Implemented
- Complications, Issues, and moving forward as One Company
- Q & A

Nearly four centuries of collective innovation



150 years and going strong!





140+
Manufacturing
Sites

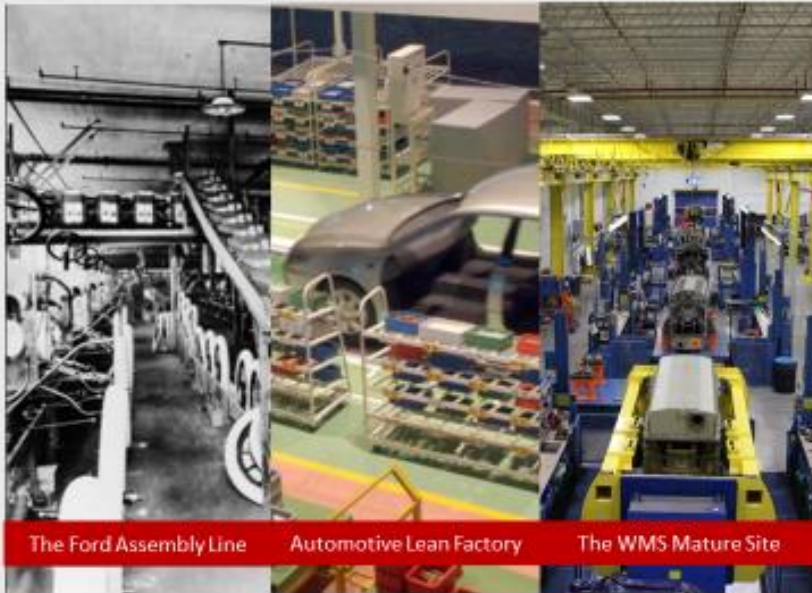
Equipment	Components	Services	Digital
23,000+	100+	17,000+	20,000+
Locomotives in installed base	Countries with Wabtec products on locomotives and freight cars	Locomotives monitored globally +2.5 million data points analyzed	Locomotives equipped with PTC computers/software



Wabtec Management System



What is Wabtec Management System?



Driving digital maturity
built on lean foundation
with continuous
improvement

- ✓ Lean and Efficient
- ✓ Smart and Digital
- ✓ Real Time Visibility and Optimized
- ✓ Culture of Continuous Improvement

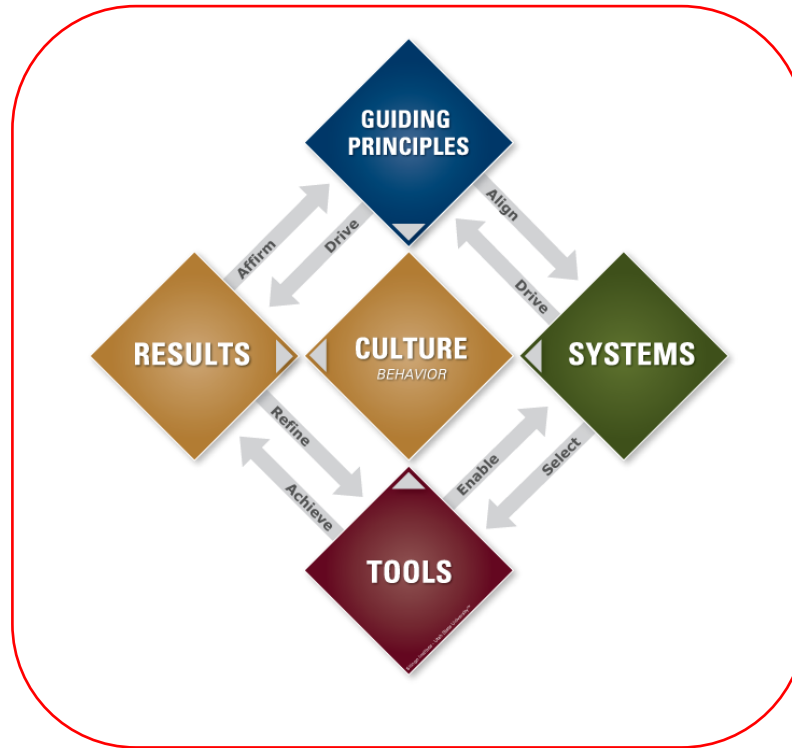
Lean Strategy

Competitiveness, Efficiency, Productivity

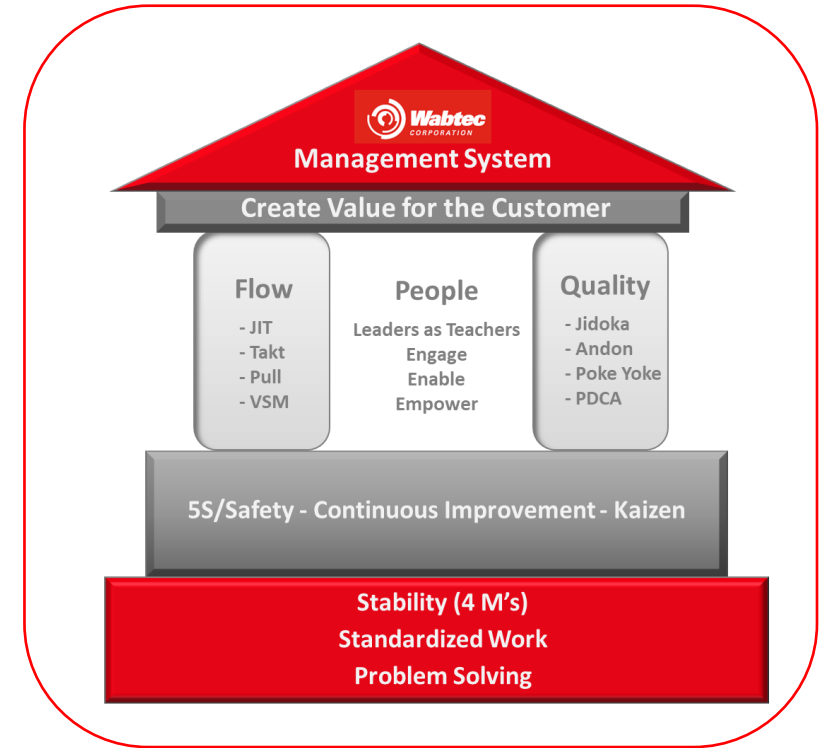
WHY: Guiding Principles



WHAT: Shingo Model



HOW: Wabtec Management System



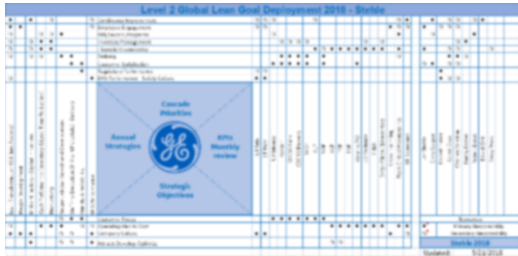
our path to Excellence



Vision



True North Deployment

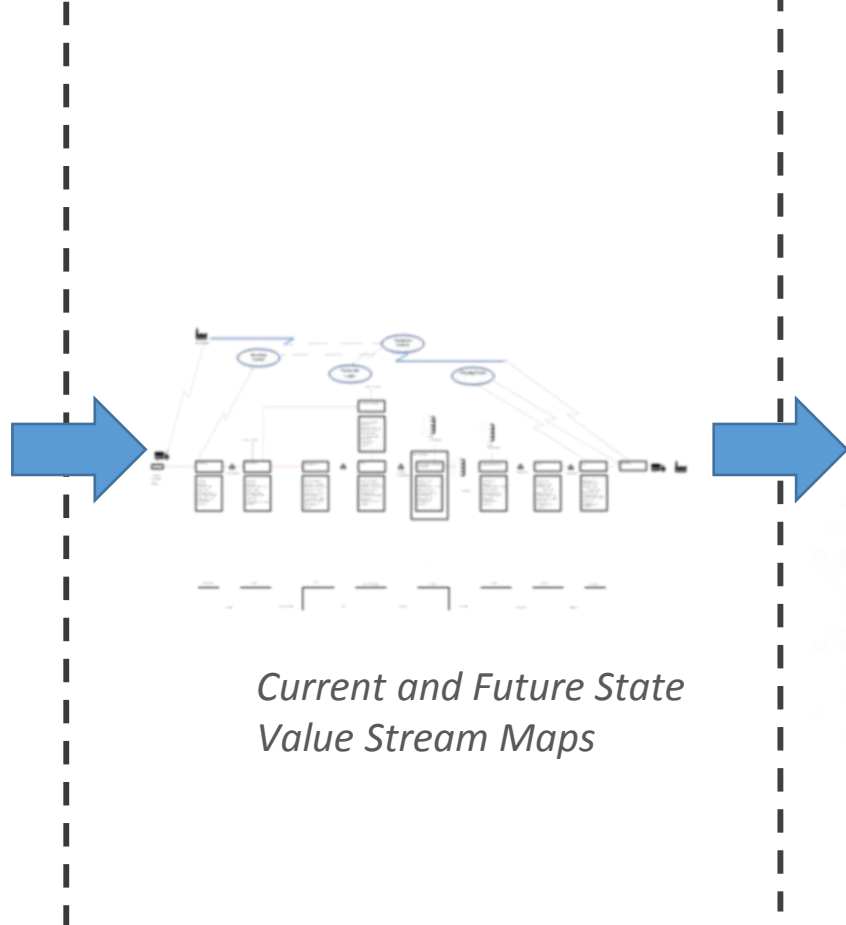


Site Priorities

Level	Elements	Assessment	2018 Goal
Fundamentals	Leadership & Culture	3.2	3.2
	Manufacturing Systems	3.2	3.2
	Quality	3.2	3.2
	People	3.2	3.2
Fundamentals Average		3.06	3.05
Advanced	Manufacturing Systems	3.2	3.2
	Quality	3.2	3.2
	People	3.2	3.2
	Innovation	3.2	3.2
Fundamentals & Advanced Average		3.16	3.13
Overall Total	Innovation	3.2	3.2
All in Average		3.15	3.13

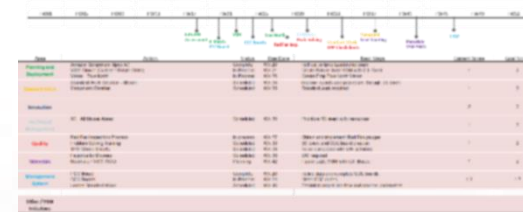
Lean Scorecard

Value Stream



Current and Future State Value Stream Maps

Lean Roadmap



Establish Roadmap And Action Plan

2018 Priorities				EMP - Stehle			
Area	2018	2019	2020	Area	2018	2019	2020
Quality	3.2	3.2	3.2	Quality	3.2	3.2	3.2
Manufacturing Systems	3.2	3.2	3.2	Manufacturing Systems	3.2	3.2	3.2
People	3.2	3.2	3.2	People	3.2	3.2	3.2
Innovation	3.2	3.2	3.2	Innovation	3.2	3.2	3.2
Fundamentals Average		3.06	3.05	Fundamentals Average		3.06	3.05
Advanced Average		3.16	3.13	Advanced Average		3.16	3.13
All in Average		3.15	3.13	All in Average		3.15	3.13

Link with Site Metrics

Strategy Deployment Wall and X-Matrix

Constancy of Purpose
True North



Level 2 Global Lean Goal Deployment 2018 - Sheila

Area	Strategic Objective	2018 Goal	2019 Goal	2020 Goal	2021 Goal	2022 Goal	2023 Goal	2024 Goal	2025 Goal
Manufacturing	Continuous Improvement	...	...	...	...	...	...	...	...
	Quality	...	...	...	...	...	...	...	...
	Cost	...	...	...	...	...	...	...	...
	Delivery	...	...	...	...	...	...	...	...
Supply Chain	Inventory	...	...	...	...	...	...	...	...
	Logistics	...	...	...	...	...	...	...	...
	Procurement	...	...	...	...	...	...	...	...
	Customer Service	...	...	...	...	...	...	...	...
Support Functions	HR	...	...	...	...	...	...	...	...
	Finance	...	...	...	...	...	...	...	...
	IT	...	...	...	...	...	...	...	...
	Legal	...	...	...	...	...	...	...	...

Updated: 5/15/2018

Las Vegas Strategy Deployment Wall

Las Vegas

Vision

We commit to developing a safe, world class production environment while striving for excellence in customer satisfaction.

Mission

Powering the Rail Industry by remanufacturing traction motors to the highest quality by using a combination of safety, quality, Lean tools, and a skilled, dedicated workforce



Karthikeyan Shanmugam
GM

Plant Manager Commitment

The Las Vegas Leadership is committed to providing a safe environment for our employees, shipping our products with the highest reliability, and exceeding our customer's expectations for service, while continuously improving our organization.





Plant Future VSM



X-Matrix




Owner	Goals	Projects
 Nancy Mathews SVP Manager	HR Performance – Safety Culture 100% Safety Culture 100% Safety Culture	
 Scott Barker Quality Manager	Quality – Customer Satisfaction 100% Quality 100% Customer Satisfaction	
 James Baehler Traction Customer Manager	Service – Delivery 100% On-Time Delivery 100% On-Time Delivery	
 Karthikeyan Shanmugam GM  Nyle Sherry Lean Leader	Cost 100% Cost Reduction 100% Cost Reduction Lean Culture 100% Lean Culture	

Diesel Engine Remanufacturing

Grove City, PA



Grove City, PA Engine Remanufacturing



A Tale of Two Sites

AME
CHICAGO
INTERNATIONAL CONFERENCE
2019



Key tenants of WMS

Operational BASICS

- ✓ Visual leadership support and engagement on lean/CI
- ✓ Std. work established (including hazard and risk awareness/compliance)
- ✓ Visual Workplace/5S in place (easy to spot Abnormal)
- ✓ Point of Use material presentation (kitting, SM/Pull)
- ✓ Takt Time established, line balanced to meet Takt
- ✓ Machine efficiency initial TPM/SMED
- ✓ Single Piece Flow operation (no batching)
- ✓ Andon escalation system in place to resolve abnormality quickly
- ✓ Turning leadership support to drive, leader led lean transformation

Operating SYSTEMS

- ✓ True North / Strategy Deployment System in place (Vision-Breakthrough Objectives-Execution plan aligned)
- ✓ Visual Process Adherence/Visual Process Performance System in place - Extremely Visual Workplace
- ✓ Leader Std. work/Std. Gemba Operating System
- ✓ Structured Problem Solving System (PDCA cycles)
- ✓ Q4 leadership, feedback reach, high level of trust, leader as well as a coach
- ✓ Improvement System / Idea Generation and Implementation System
- ✓ Lean Management System in place

Operational Excellence CULTURE

- ✓ Lean Beliefs personalized. Values, Guiding Principles & Beliefs aligned
- ✓ Ideal Behaviors defined, modeled and coached through the organization
- ✓ Daily CI/Kaizen culture (I want to be better today than I was yesterday...)
- ✓ The entire organization embraces lean as a Time Based Growth Strategy

Additional Lean Tools

Gemba and Team Engagement



3P – Product Preparation Process

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NOV. 4-7
Leading
ON THE
Edge



Digital Tools

Smart Machines... giving machines a voice

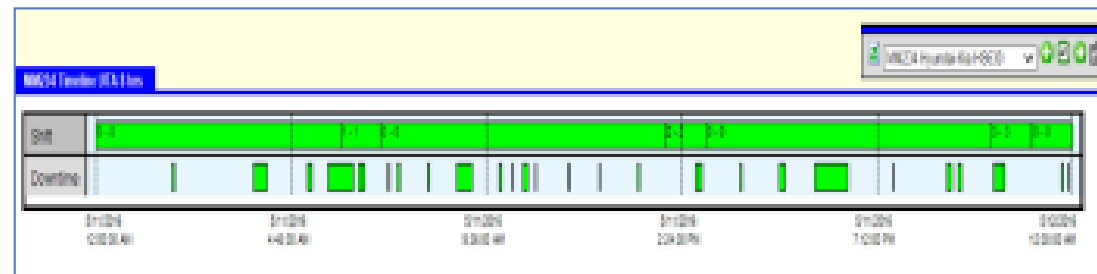
Plant Overview (Real Time)

- “Heartbeat of the plant”
- Real time alerts for excessive down time
- Drill down capability



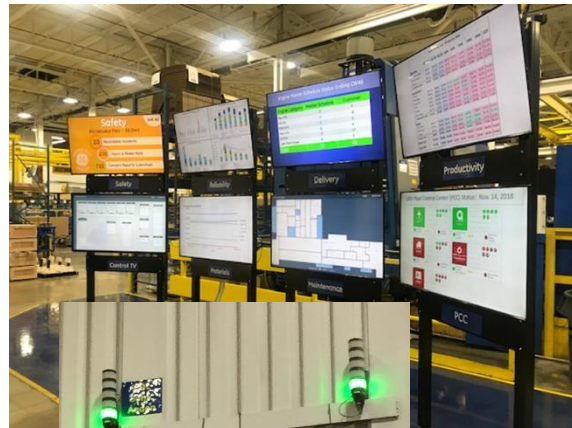
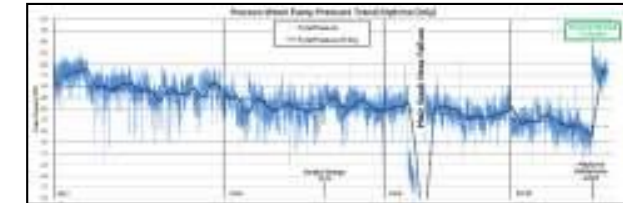
Historical Running / Not Running

- Identify areas of waste
- Investigate and improve
- Sustain



Machine health information (Predictive)

- Alerting capability for out of spec variables
- Preventive maintenance and rapid triage of issues

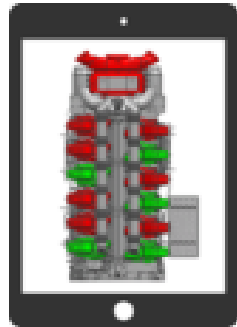


Similar Process Pump From Start Worker

Smart Parts...

auto-data capture

**Data
Matrix**



**Conditional
Process
Routing**

**Radio
Frequency
IDentification**



**Bluetooth
Gauges**



**Visual
Recognition**

Benefits

- **Part Traceability...** accurately maintain genealogy
- **Populating the Database...** integrated with pillar applications
- **Increased analytics yield...** accuracy & repeatability
- **Efficiency...** to offset increased data capture requirements



Integration of Lean across Three Companies



Focus Sites (approx. 10%)

Highly focused on-site support of local team with the right skills to deliver objectives - Drive a Lean Culture with an engaged team, while addressing Critical Business Needs by leveraging corporate resources.



All Sites – Standardization

Continue to drive lean initiatives, align tools / methodologies, provide standard lean requirements (Wabtec Management System) and KPI's. Taking the Best of All System!



Wabtec 140+ Sites

Create self sufficient sites with hands on training at "Centers of Excellence" with access to Lean Experts.
Uniform Training and Support (Train the Trainer)

Training Content – 3 Customized Levels



Leadership, Train the Trainer, Practitioner



Key Learnings:

- ✓ Tools, Technology is the "easy" part... it's all about PEOPLE & CULTURE
- ✓ Lean before Digital
- ✓ Transform Data to Insights then Insights to Outcome
- ✓ Connecting all the dots drives significant benefits
- ✓ Lean is a journey not a destination

Q & A

Thank You!

Your opinion is important to us!

Please take a moment to complete the survey using the conference mobile app.

Session No: ThS/50

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