How SAP Digital Manufacturing Will Change Your Approach to MES

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SYNTAX

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SAPinsider

In This Session

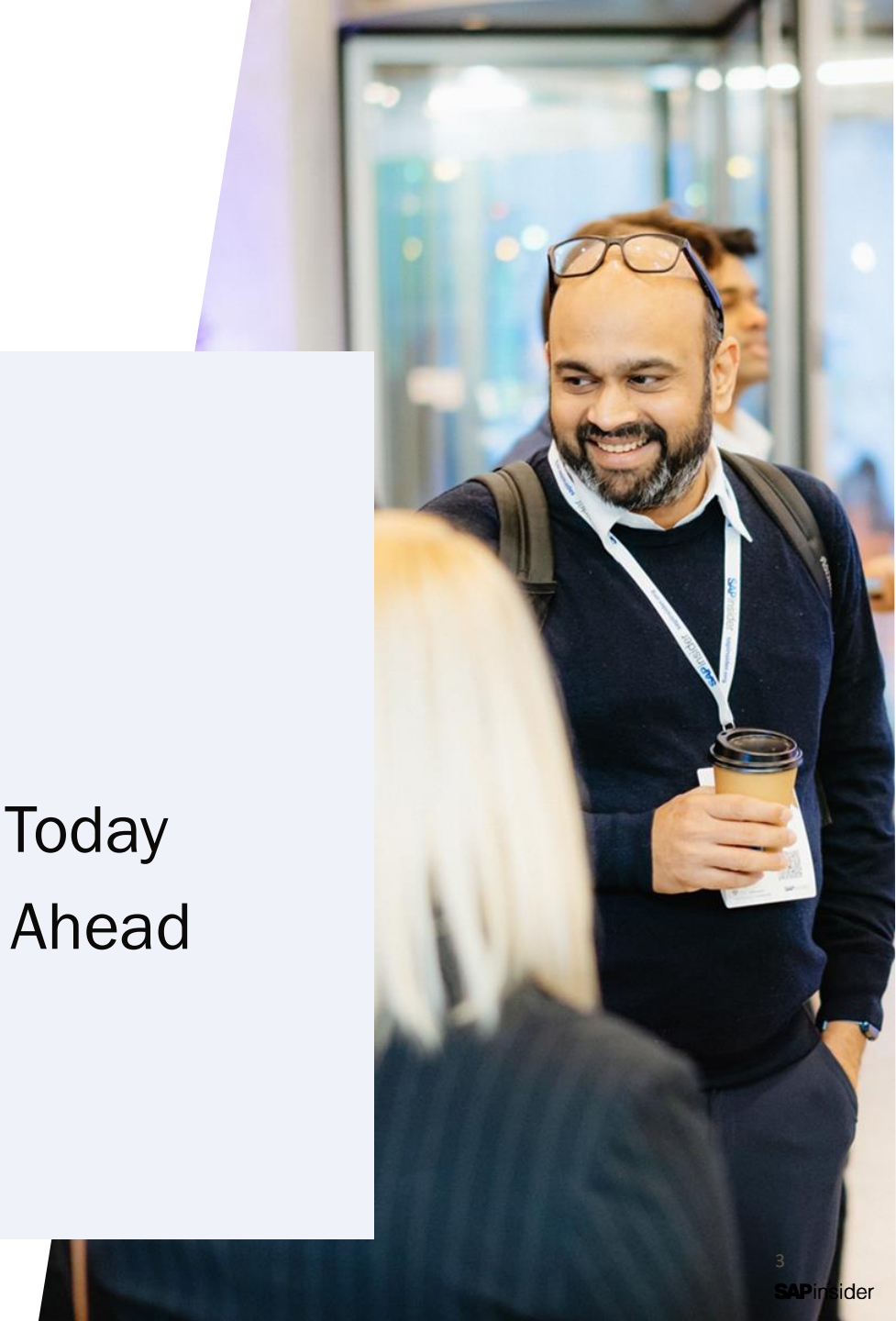
We will discuss how Manufacturing Execution in the Cloud has become a reality.

How using templated solutions and a fit to standard approach will have you rethinking what MES can do and how to manage it.

Also showing real world deployments in both discreate and process industries.

What We'll Cover

- MES: Where We Came From
- Advantages of Cloud MES
- How You Can Rethink MES
- How SAP DM is Being Applied Today
- Challenges and Opportunities Ahead
- Wrap Up



MES: Where We Came From

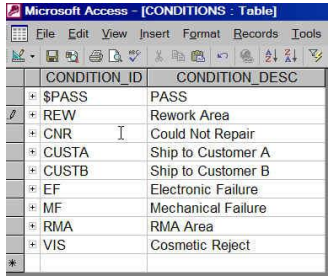
MES, A Brief History:

1980's

- Custom Unix / VAX based systems
- AMR Research develops the phrase "MES"

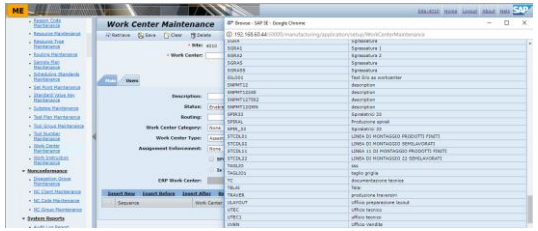
1990's

- First Commercial MES Products Offered
- Basic Shop Execution
- First Integration to ERPs



2000's

- Adding Functionality: Quality Management, Scheduling, Shop floor integration, maintenance..
- *SAP MII & SAP ME*



2010's

- More Connected
- Quality Management
- IIoT
- Industry 4.0
- Early Cloud
- *SAP DMCi / DMCe*

2020's

- Advanced Planning
- Advance Logic
- Better Integration
- Advanced Cloud
- Leveraging AI / ML
- *SAP DM*

MES: One of the Hardest Manufacturing IT Challenges

"Top Floor to Shop Floor!"

In reality, many plants have similar ERP needs

Many plants have similar automation needs and connection methods

- PLCs / SCADAs / DCS
- OPC, MQTT

MES is where everything is "different"

MES: Common Current States

- On-premise
  - Hardware Cost
  - Service Cost
  - Software Updates
- Software Derived from Specific Industries
- Various Vendors
- Multiple License / Support Agreements
- Poor Cross-organization Knowledge
- CoE is Nearly Impossible

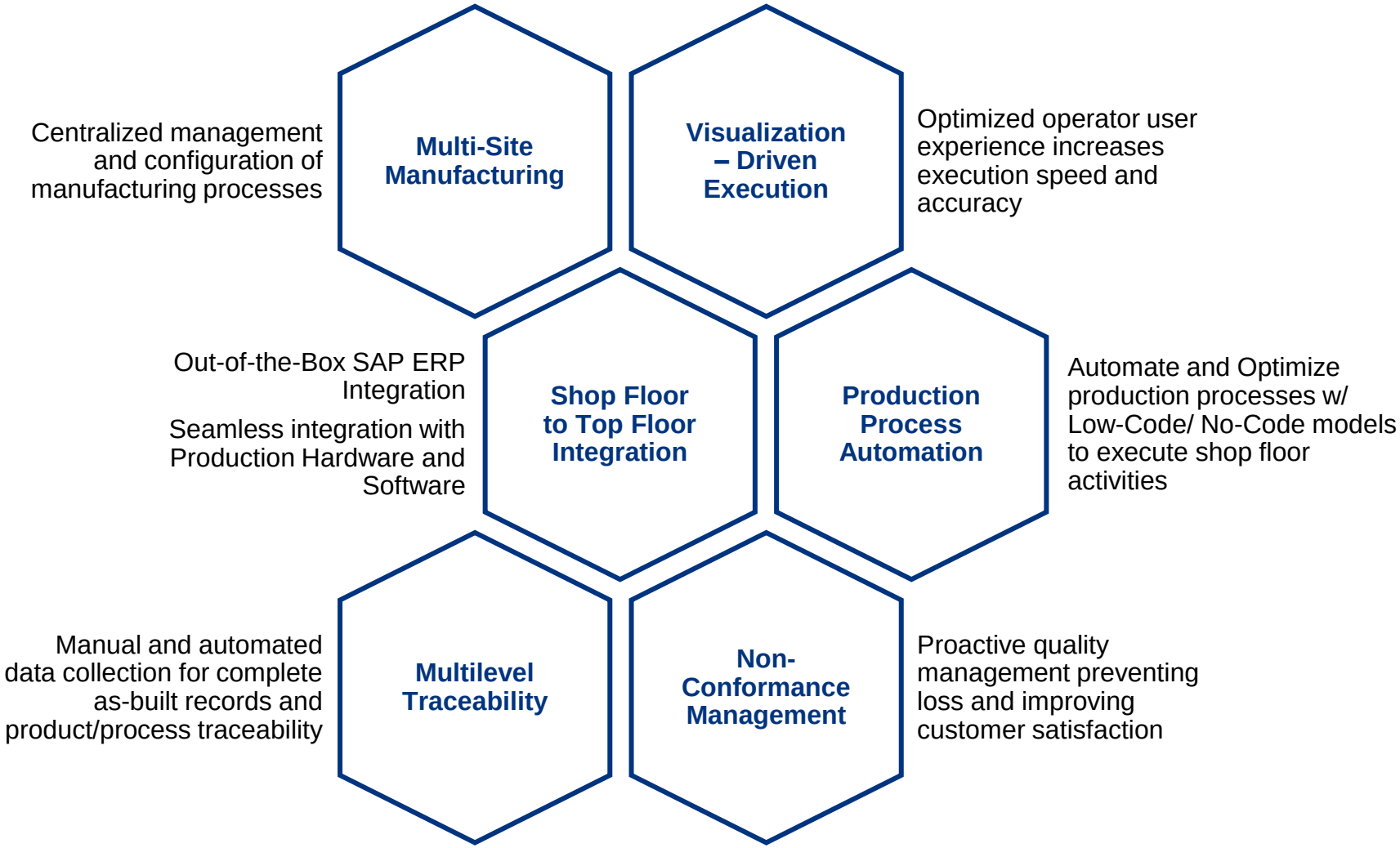
- Highly Customized or Home-Grown Systems
  - Little Standardization
  - Silos of Knowledge
  - “Apples To Oranges”

Advantages of a Cloud MES

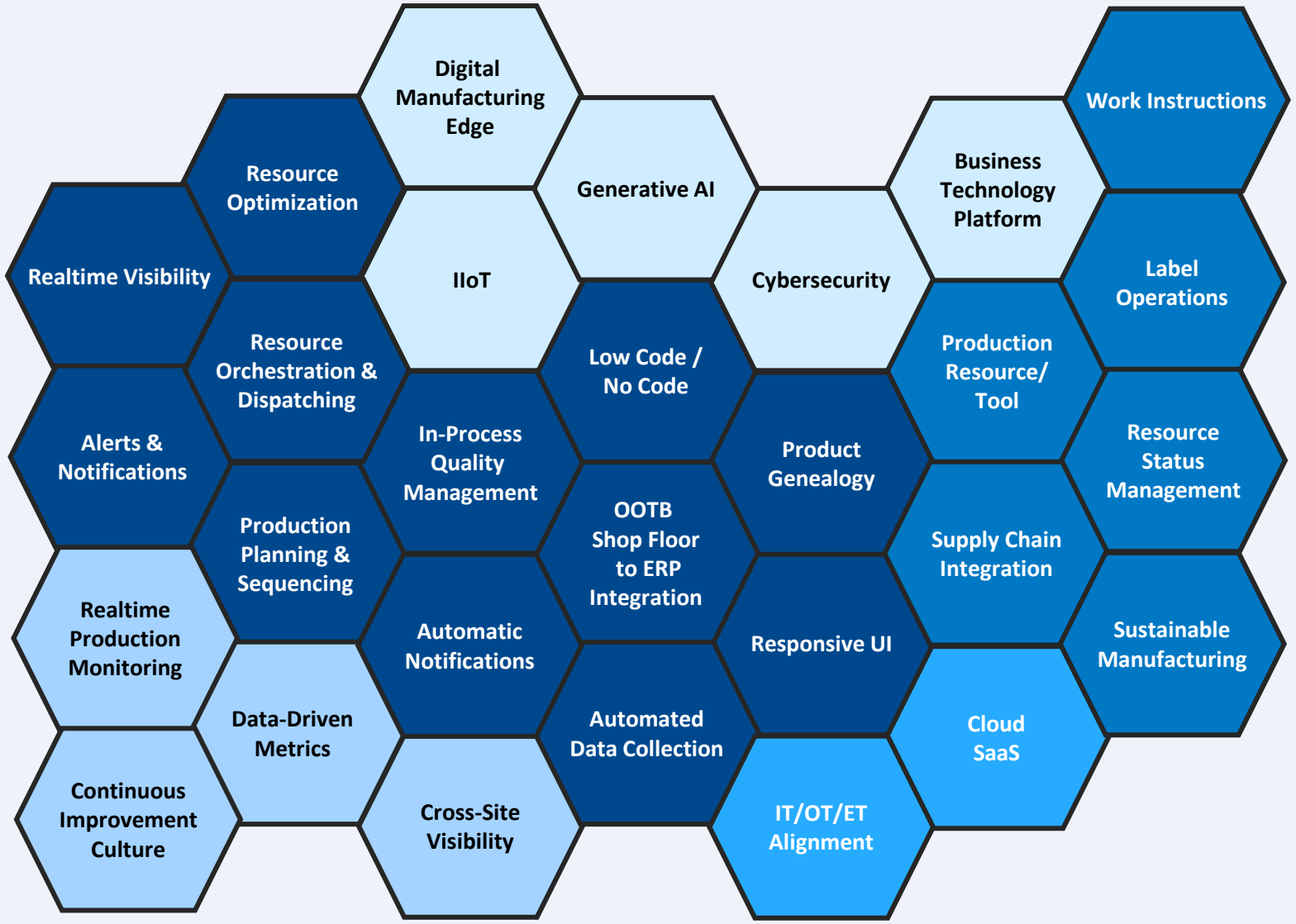
Advantages of Cloud MES

Cost Savings
Scalability
Easy Access
Uniformity
Faster Implementation
Automatic Updates
Data Security
Integration

SAP Digital Manufacturing



SAP DM Capabilities



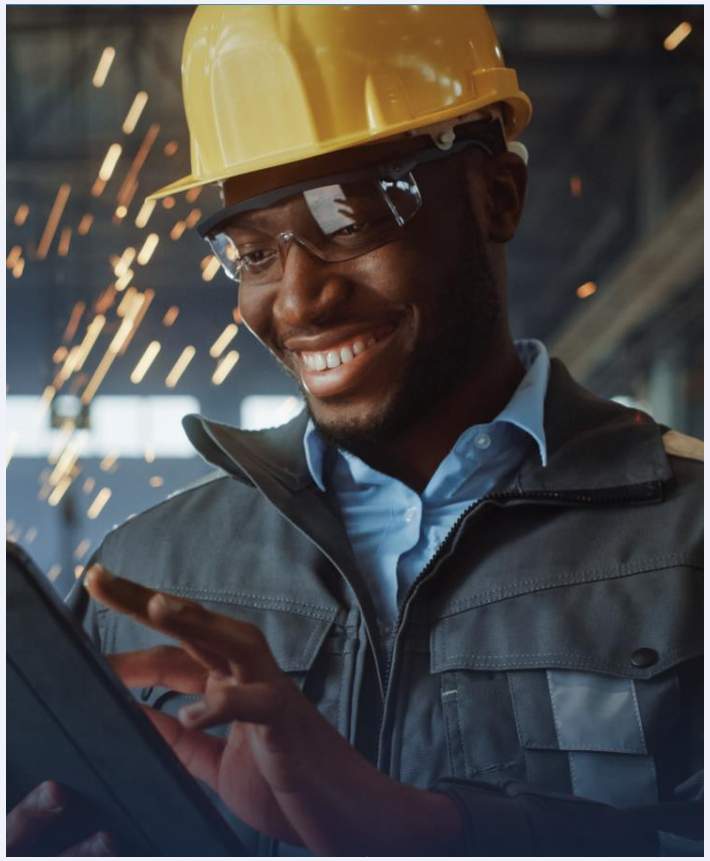
SAP Digital Manufacturing: A Cloud MES for You

Perfect for templated, fit to standard solution
- SaaS
- Automatic, Quartey updates
- Best integration to SAP ERP
  - Unmatched ease of configuration
  - Unmatched cost (connections cost $$)
- Leverages BTP

Feature Rich with Built in Features with a Familiar UI5 / Fiori interface

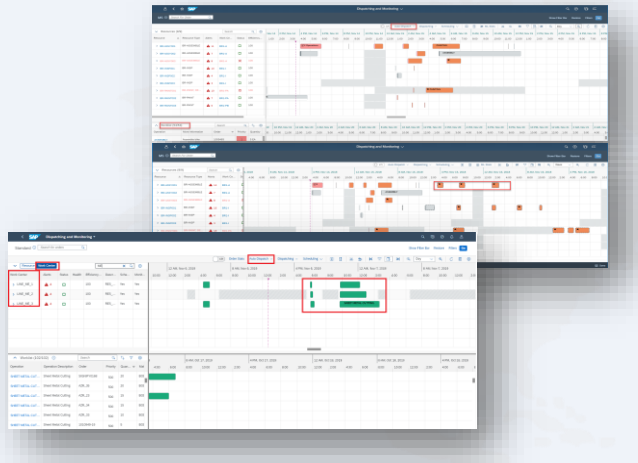
Performance
- < 2 second round trip response time

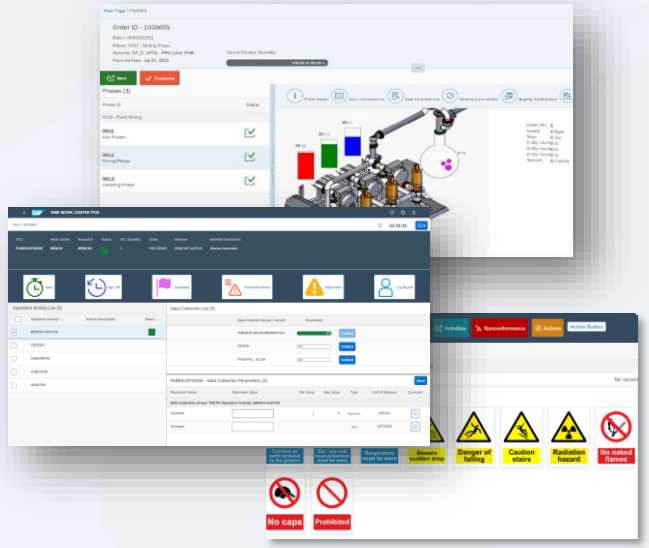
Configurability
- Supports Many Custom data fields from ERP
- Built in Logic Engine (Production Process Designer)

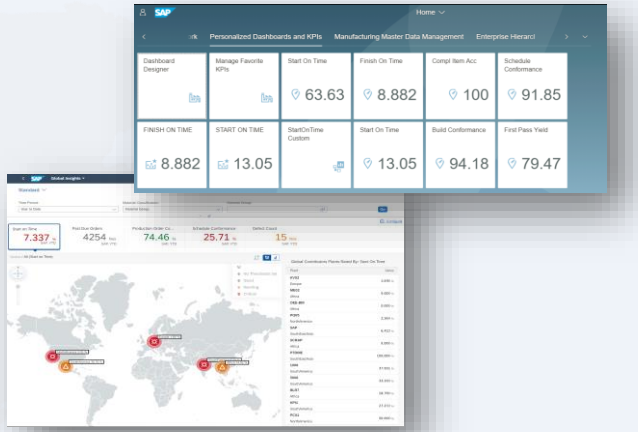


Corner Stones of MES

What Is SAP Digital Manufacturing?







DM Resource Orchestration

- Dispatching & Monitoring
- Labor Management
- “Real World” Transparency

DM Execution

- Controlling Execution
- Collecting Data
- Guiding Users

DM Insights

- Manufacturing KPIs
- Analysis / SAC
- Dashboards

How Can You Rethink MES?

Challenge Tradition

Traditional MES Solution		SAP DM Solution
On Premise	→	Cloud base on BTP
Single Site / Line of Business Solution	→	Global Template, Configured for Sites
Custom Developed UIs	→	Configured UIs
Custom Integration to SAP ERP	→	Built in Integration to SAP ERP
Custom Database / SPs	→	Built HANA Database with API interfaces
MES as a “catch all” • MES works around questionable ERP Master Data • Mini ERP • Mini SCADA • Mini Warehousing	→	SAP DM is part of holistic solution. When implementing SAP DM, it is best to leverage SAP best practices for ERP, EWM etc.

Deploy Globally, Configure Locally

- Global Template
  - One MES solution globally. It can be done!
  - Planning, Discovery, Design
  - Governance
  - Configuration, Not Customization
- Break Down the Silos
  - Operation
  - Scheduling
  - Data
  - Analytics
  - Machine Connectivity
  - Warehousing
- Sponsored from Leadership but with local buy in
  - Ownership of the solution in the plants
  - Key users at each plant

Objective

“You Will Like What You Get!”

Template Roadmap

Fit-to-Standard Scoping Workshops on-site with Pilot Plants & Business

Template Team to develop & document the template

Build Deploy at Pilot Plants

Documented User Stories, Business Processes, and Configurations

Created Template Configurator & Template Backlog with User Stories

Managed approvals

Program Governance

- Center of Excellence
- Global Steering Committee
- Define data governance policies
- Establish a Project Leadership Team
- Define Governance Policies and Standards
- Standardize Master Data
- Site-Specific Rollout Teams
- Compliance and Regulatory Alignment
- Risk Assessment and Mitigation
- Performance Metrics and KPIs
- OCM program for plant adoption and ownership

Pilot Locations: Putting the Template to the Test

Chose locations that are representative

Similar challenges, process flow types, regulatory, quality plan and planning methods

Don’t focus just on similar products!

- Sometime vastly different products very common process flows
  - *e.g. Tires and Pastries*

Extensive discovery

- Find the commonalties, build from the core
- Order, Routings, QC plans, production plans, warehousing etc..
- Are you use best practices in your ERP?
- Data collection points and intervals
- Inspections and Work Instructions
- Machine Connectivity
- Reporting Needs

Rollouts: Applying the Global Template Locally

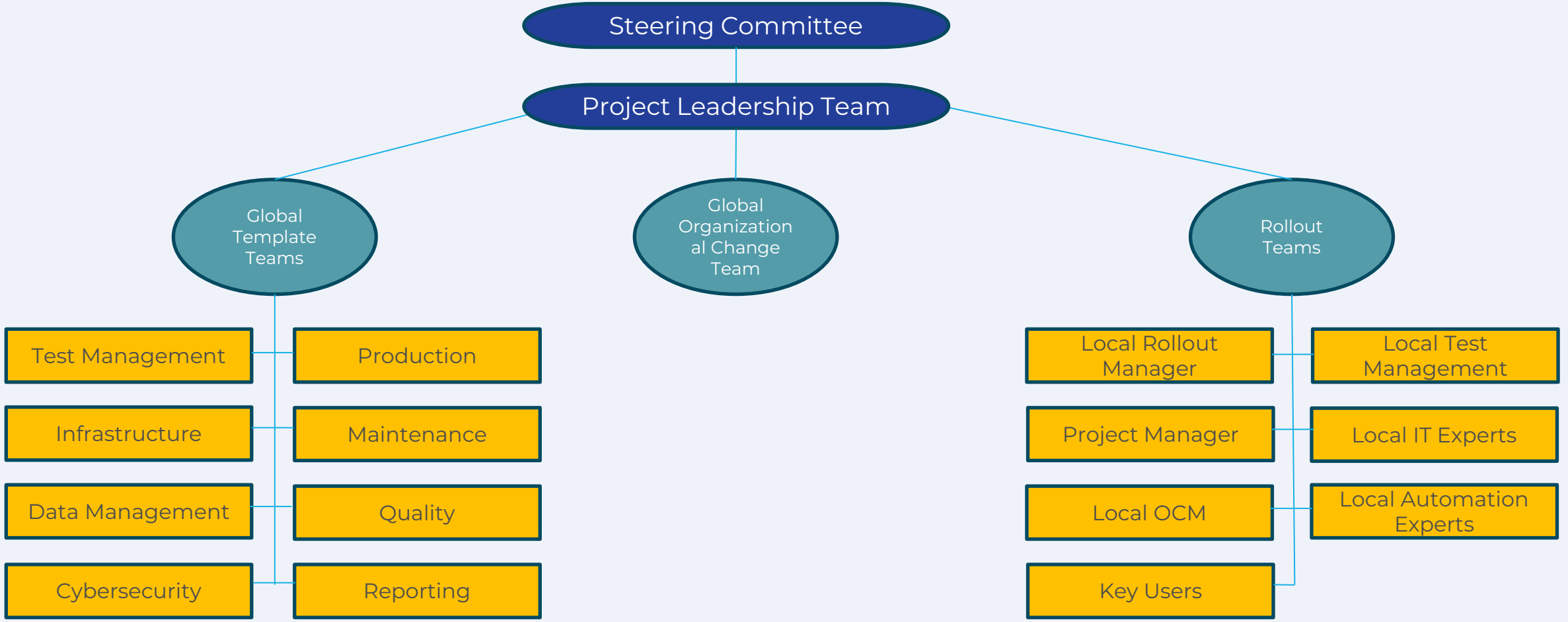
Prepare
- Staffing Complete
- Preparation Workshops
- Technical Infrastructure
- Initial DM Configured
- Master Data Gaps Defined
- Global Project Plan Refined
- Machine Integration Concept Finalized

Explore
- Communication strategy Defined
- Template Refinement Complete
- Master Data Clean Up
- Machine Connectivity
- Template Fit Workshops
- Gap Analysis
- Enhancement Request if applicable

Realize
- Define Service/After Go Live Strategy
- Implement Template
- Unit Testing
- Template Extensions
- Productive Infrastructure Access
- Master Data Readiness ERP

Deploy
- End User Hardware Testing
- UAT / SIT
- Bug Fix and Tracking
- Cutover
- Run
- Go Live
- Hypercare and Final Acceptance
- Technical Handover

Project Rollout Organizational Structure



Accelerators

Template Configurators
- Multiple options for specific use cases and user stories

Reusable Production Process Designs

Mass Data Upload Tools

Machine Connectivity Standards

Tight Coordination with OCM
- Locations must be comfortable with the change
- Local buy in is a must
- Sensitivity to plant culture

How SAP DM is Being Applied Today

Sample of over 200 Customers Live or In-Process with DM

Discrete Industry
- Automotive
- Industrial Manufacturing
- High-Tech
- Consumer Products
- Life Sciences
- Medial Device

Process Industry
- Consumer Products
- Chemical (Batch)
- O&G Petrochemical
- Life Sciences
- Pharmaceutical
- Mill Products

Zeiss: Achieving a Smart Factory Transformation in the Cloud

Before: Challenges and Opportunities

- Desire to carry out its cloud-first digital transformation strategy, streamlining and automating shop floor and manufacturing processes
- Identification of a cloud-based manufacturing execution system (MES) to underpin its smart production lines of the future
- Very high standards of testing and documentation required to meet regulatory obligations

After: Value-Driven Results

- Facilitated direct interaction between the shop floor and the MES, eliminating manual inputs
- Optimized manufacturing performance and delivered significant efficiency gains by integrating production execution, visibility, and analysis processes
- Enabled more accessible and transparent production information for the management team
- Increased production output and improved product quality

ZEISS

- "We are just at the beginning of our **smart factory transformation journey**. With the SAP Digital Manufacturing solution, we will make manufacturing more intelligent, more efficient, and more productive now and in the years to come."

Jochen Scheuerer, Head of Connected Smart Factory, Carl Zeiss AG (ZEISS Group)

- **~100%**
  - Elimination of paper-based digital history record printing
- **~3x**
  - More efficient, going from 3 parallel rollouts to 10

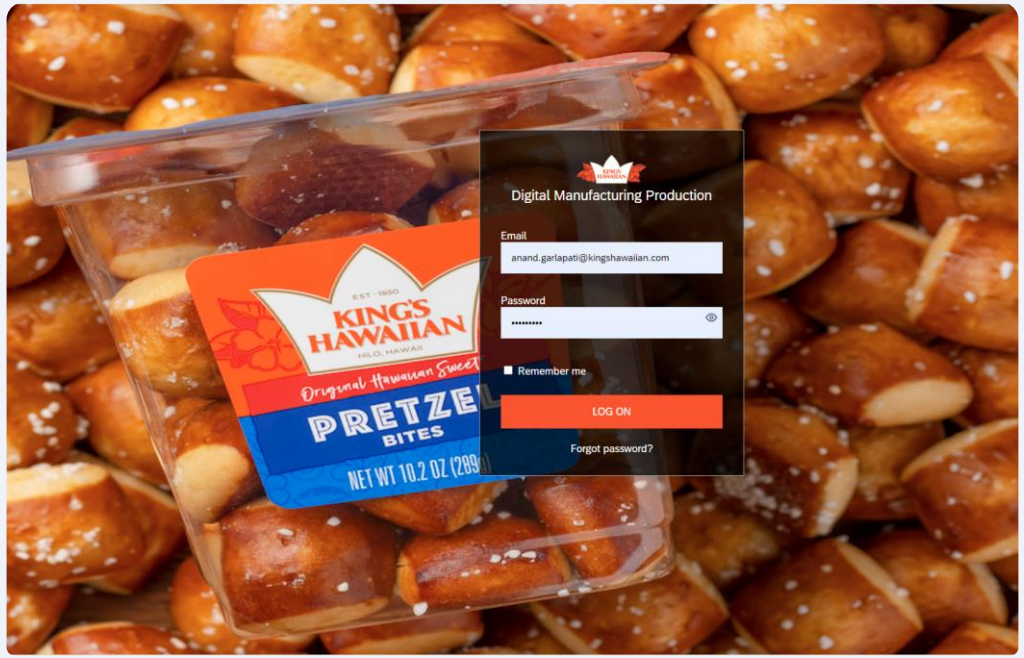
King’s Hawaiian: Making Irresistible Bread with Data in a Sustainable, Automated Plant

King's Hawaiian is a renowned brand known for its delicious and authentic Hawaiian bakery products. Since its founding in Hilo, Hawaii in the 1950s, the company has mastered the art of crafting irresistible bread and rolls (pastry items) that capture the essence of the Hawaiian spirit. Their products have become a staple on tables across the country.

King's Hawaiian and Syntax have joined forces to introduce their latest initiative, deploying SAP Digital Manufacturing. The inauguration of King's Hawaiian's new facility marks the beginning of operations with state-of-the-art equipment and cutting-edge software. This strategic integration aims to transform production processes, elevate operational efficiency, and underscore their dedication to crafting irresistible bread.

Why King’s Hawaiian Chose SAP DM

- MII is sunsetting in 2027
- DM is SAP's next generation MES (Industry 4.0)
- DM helps with Kings Hawaiian vision around quality and efficiency.
- DM enables AI and ML
- DM helps with Predictive analytics
- Data collection and Inbuilt analytics
- DM helps with automation of manufacturing operation with shop floor execution, integrated plant maintenance, inventory management



King’s Hawaiian Business Benefits

More automation with highly flexible, reliable and scalable manufacturing platform which allows KH to introduce new lines and new plants quickly

Global Template standardization in all areas (all plants and all lines)

Visibility of Manufacturing operation at all levels (resource level to Plant level)

Reduced Downtime and Increased productivity

Reduced Manual effort due to automation and efficient technologies
Nearly a “lights out” facility

Consistent and High-quality product with more streamlined and efficient quality control

Data Security

High Traceability

Data Collection for Machine learning (Digitize the tribal knowledge)

More accurate through put rates and actual cost of product and overheads

48hrs
Local Survivability

400+
Machine Data Collection Points

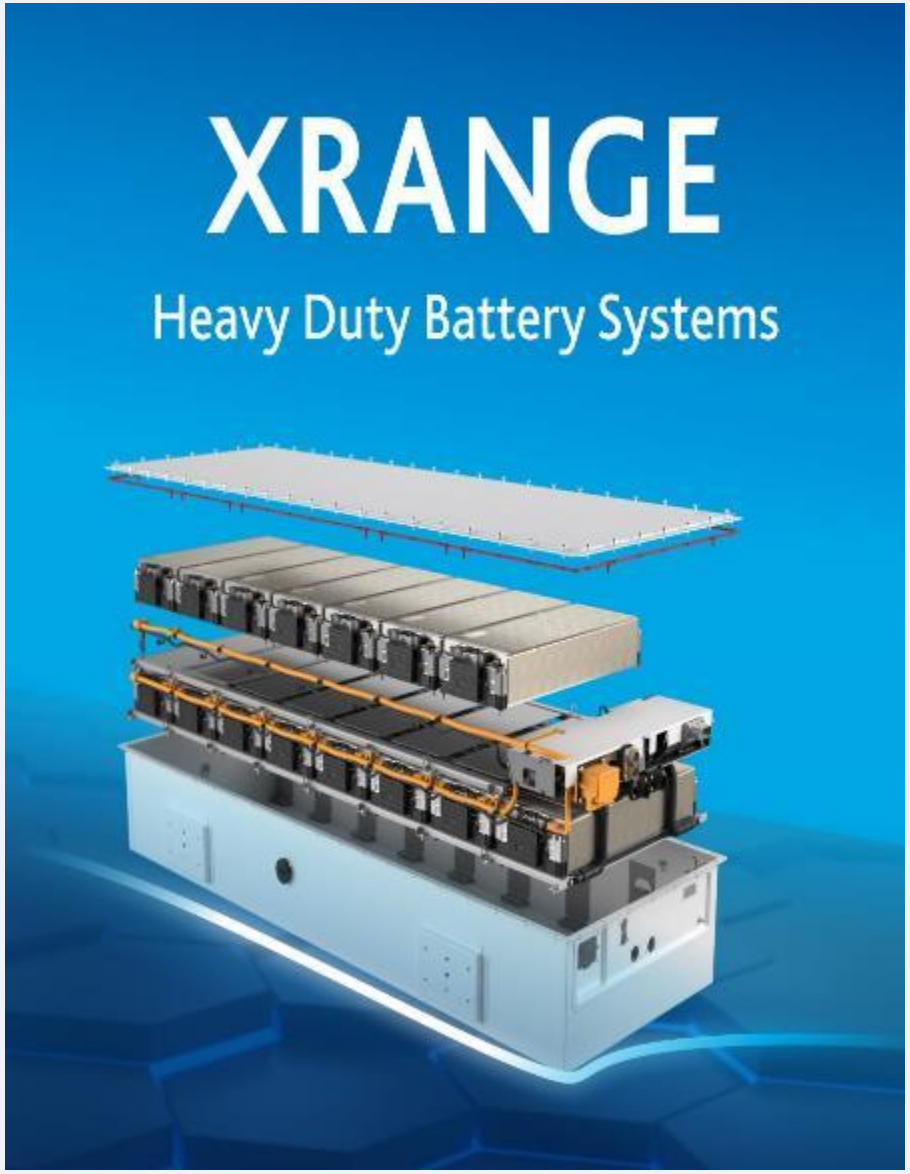
“Digital manufacturing is the tool that will allow us to control the entire process from a central location, from analyzing the dough we’re mixing to getting a delicious, consistent product out the door to the consumer.”

– Ray Fager, Chief Data & Analytics Officer, King’s Hawaiian

Freudenberg e-Power Systems

Powering the Next Generation of Transportation

- Freudenberg e-Power Systems is one of the world's leading suppliers of emission-neutral energy systems for heavy-duty applications. With its experience and expertise in battery and fuel cell technology, the business group offers tailor-made solutions, in particular combined systems, for sustainable and economical e-mobility.
- In collaboration with dedicated and innovative teams at both Freudenberg E-power Systems and Syntax, we have ushered in a new era of manufacturing excellence. With SAP Digital Manufacturing, Freudenberg E Power Systems is now equipped with state-of-the-art technology to revolutionize their production processes, enhance operational efficiency, and reinforce their commitment to sustainable energy solutions



FEPS Business Benefits

Before: Challenges and Opportunities

- A New packaging line required a high speed, full featured MES
- Older home-grown MES solution requiring continuously updates and manual intervention.
- Looking for a turnkey cloud solution to address MES requirements.
- Operating in a very fast paced sector – looing to revolutionize production processes and enhance operational efficiency.

After: Value-Driven Results

- Efficiency - Streamlined manufacturing processes, optimizing efficiency. Real-time data analytics and intelligent insights will drive smarter decisions, leading to operational excellence and reduced production costs.
- Quality - Implemented stringent quality control measures. Every component leaving the facility is backed by data-driven quality assurance, guaranteeing reliability and customer satisfaction.
- Innovation Integration: Seamlessly integrated shop floor machines with ERP data in real time.
- Sustainability - Optimized resource utilization, reduced waste, and minimized environmental footprint. This commitment aligns with the global drive toward eco-conscious manufacturing practices.

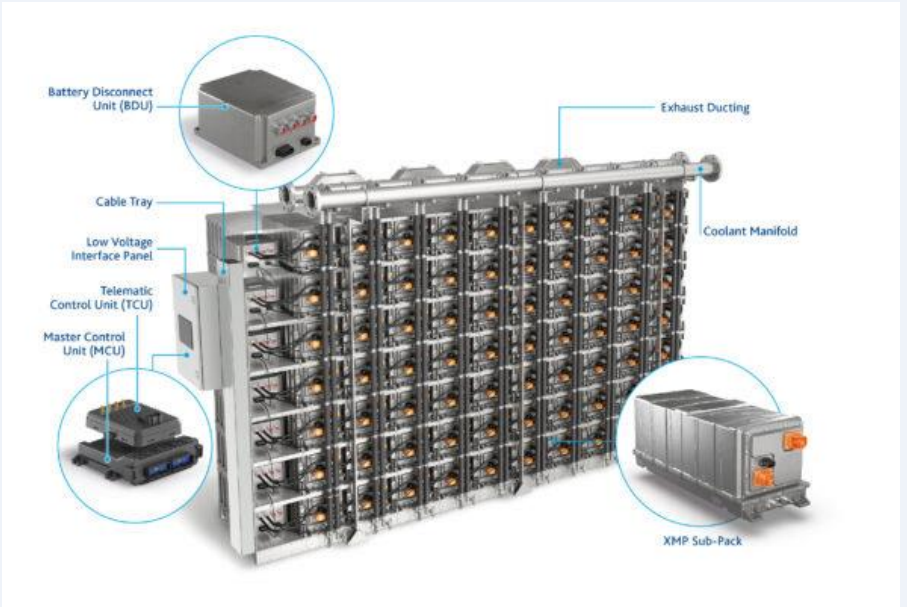
FREUDENBERG
INNOVATING TOGETHER

33%

Increase in production

<2 sec.

MES machine Response Time



Challenges and Opportunities

Current Challenges

We are collecting all this data. How can we use it in meaningful ways?

Digital Manufacturing Insights (built-in) has extensive reporting, to extend this SAP offers Analytics Cloud to analyze data from many sources.

How reliable is a cloud MES?

System Availability is Ensured via Service Level Agreement, highly reliable with 24x7 support

How do we extend the DM to add functionality?

SAP DM is built on the BTP platform, which offers many extensibility options using tools such as Cloud Foundry

How do we connect to <XYZ> machine or 3rd party system?

Although individual protocols or methods will vary, SAP DM has a full featured API that can be accessed, in addition DM's production process can make external API call

How do we get informed of upcoming updates to DM?

In addition to the product road map, specific updates for each update are communicated well in advance of every update.

Opportunities

As your business needs grow, so will SAP

Some Examples:

- Asset Management
- Quality
- Edge Automation
- Worker Guidance
- Reporting
- Compliance
- AI and ML

Current State of MES: “This is what I am doing, with this knowledge I have to decide how to improve”

Future State of MES: “This is what I am doing, what suggestions does MES have so that I can improve?”

Wrap Up

Over the last 40 years, we have seen a dramatic evolution of MES systems. Cloud MES is the next step in revolutionizing your shop floor.

Your business now has the ability to deploy a global template, enterprise wide lower your total cost, but more importantly, retaining flexibility and reliability for individual plants.

SAP DM has evolved, through SAP's over 20-year history of MES experience and machine connectivity, it a true enterprise level solution for that allows you to rethink and reimagine your enterprise MES

Where to Find More Information

SAP DM Roadmap

- SAP Road Map Explorer

SAP DM Release Schedule and Dates

- Release Schedule and Dates | SAP Help Portal

SAP Digital Manufacturing Documentation

- SAP Digital Manufacturing | SAP Help Portal

SAP Trust Center

- SAP Trust Center | Security, Privacy, Cloud Status & More

Syntax Digital Factory

- Digital Factory – Syntax
- SAP Digital Manufacturing Cloud:Asset Downloaded (syntax.com)

Key Points to Take Home

- Cloud Based MES solutions now provide an ability to deploy enterprise level, global templated solution.
- Cloud solutions lower your overall cost
- Template solutions require careful planning and governance
- Rollouts should well managed, including OCM
- SAP DM is part of holistic solution; deployments should always include best practice evaluations for your ERP
- SAP DM is transforming manufacturing for companies all over the world

Thank you! Any Questions?

Doug Holtke

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Please remember to complete your session evaluation.

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