

The journey to Smart
Maintenance Management,
powered by EY



Building a better
working world

Smart equipment through smarter people

EY Smart Factory framework

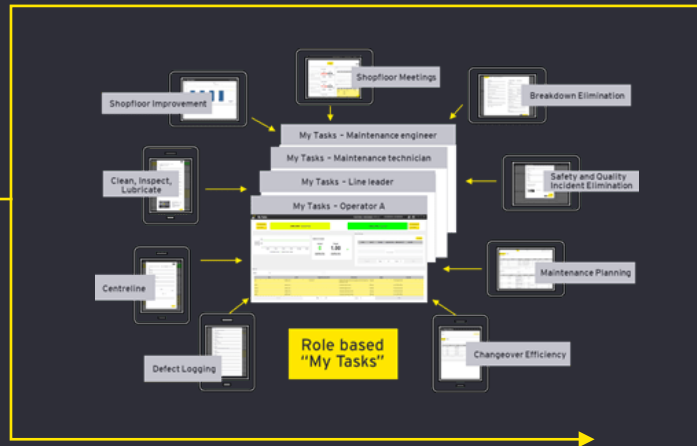
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Smart Deployment Console



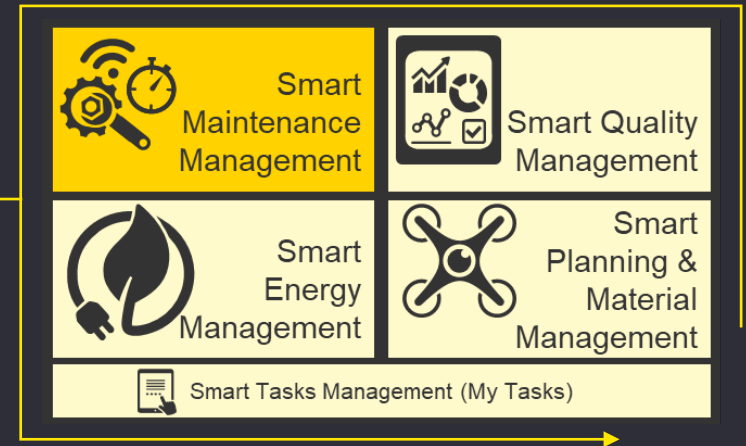
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Smart Daily Management



3


Smart Process Optimization



Digital strategy and transformation management


Setting the foundations of digitalization through operational excellence




 **Servant leadership**

 **Standards**

 **Culture of excellence**

 **Value driven**

 **Employee ownership**

Catalyst Smart Deployment Console

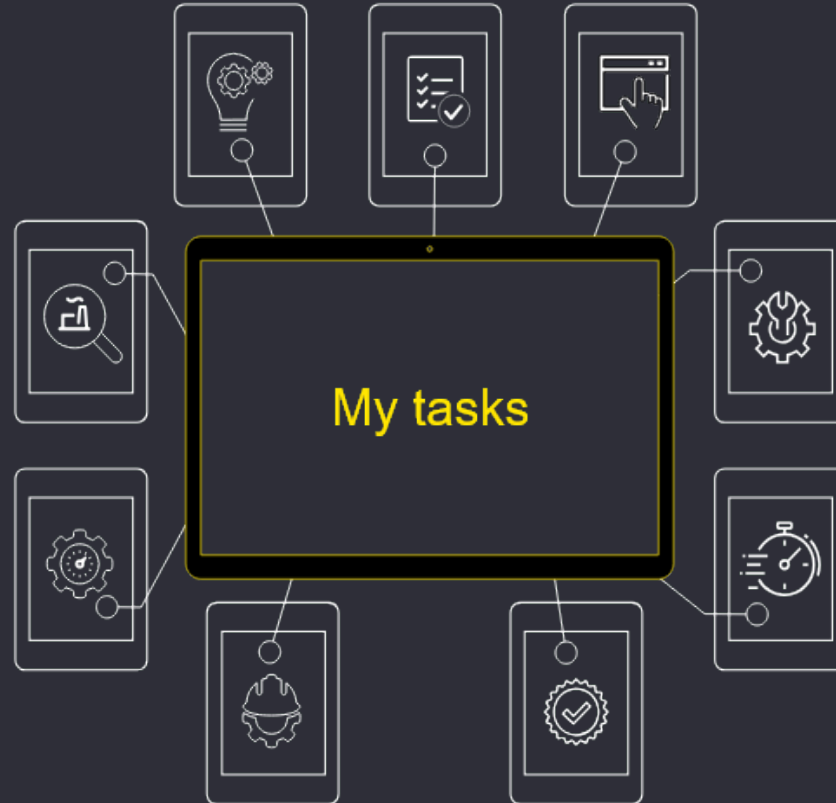
Plan, do, check, act

INTEGRATED WORK SYSTEM

- ▶ **Cloud-based**
- ▶ **Digital coach**
- ▶ **Library**

EY Smart Daily Management is the digital environment for all standard daily work activities

- ▶ A **paperless** digital, shopfloor
- ▶ Significant reduction in **non-value-added** work
- ▶ Drive standard work **cadence and accuracy**
- ▶ Improvement in information **workflow**
- ▶ Better **quality** of countermeasures

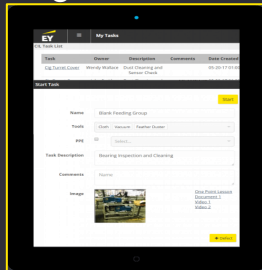


-  Shopfloor Improvement
-  **Defect Handling**
-  **Maintenance Planning & Scheduling**
-  Changeover Efficiency
-  Quality Incident Elimination
-  Safety Incident Elimination
-  Centerlining
-  **Clean Inspect Lubricate**
-  **Breakdown Elimination**

Integrating Smart Maintenance Management with SAP through applications such as e-Defects

- ▶ **Accurate** & visual recording **immediately** when defects are found, achieving better **defect identification** through correlation with other systems & tools
- ▶ Automatic **integration** with **SAP PM** maintenance & scheduling, improving **quality** of defects and execution **workflow**
- ▶ Ability to run **analytics** and **loss trends** across defects found to improve **capability building** & predictive maintenance

Defect identification during eCIL execution



eDefect Handling System recording & management

Name	Area	Customer Message	Responsible	Date	Status
Defect01	Lack Basic Conditions/Hand Reach Areas	Change of Cupo deventerating	Process Lead	04/02/2017	Pending
Defect02	Lack Basic Conditions/Hand Reach Areas		Line Lead	04/02/2017	Pending
Defect03	Minor Defects/Lack Basic Conditions/Hand Reach Areas	Clear	Line Lead	04/02/2017	Pending
Defect04	Minor Defects/Lack Basic Conditions/Hand Reach Areas	Clean Complete Work Order	Maintenance Lead	04/02/2017	Pending
Defect05	Minor Defects/Lack Basic Conditions/Hand Reach Areas	Inspect for cause	Line Lead	04/02/2017	Pending
Defect06	Minor Defects/Lack Basic Areas	adjust pack off press switch or change motor	Line Lead	04/02/2017	Pending
Defect07	Minor Defects/Lack Basic Conditions/Hand Reach Areas	Clear	Maintenance Lead	04/02/2017	Pending
Defect08	Minor Defects/Lack Basic Conditions/Hand Reach Areas	Process Lead	Process Lead	04/02/2017	Pending
Defect09	Minor Defects/Lack Basic Conditions/Hand Reach Areas	Change of Cupo deventerating	Line Lead	04/02/2017	Pending
Defect10	Minor Defects/Lack Basic Conditions/Hand Reach Areas	Complete work order	Maintenance Lead	04/02/2017	Pending

eDDS critical defects handling and communication

Item Name	Steps	Departments	Initial Cause	Root Cause	Action Required
Substation	2	301			CS
Planned	2	34			CS
Equipment	8	22			CS

ERP (e.g.: SAP PM)



High Maturity in IWS leads to successful implementation of **Smart Maintenance Management**

Smart Maintenance Management

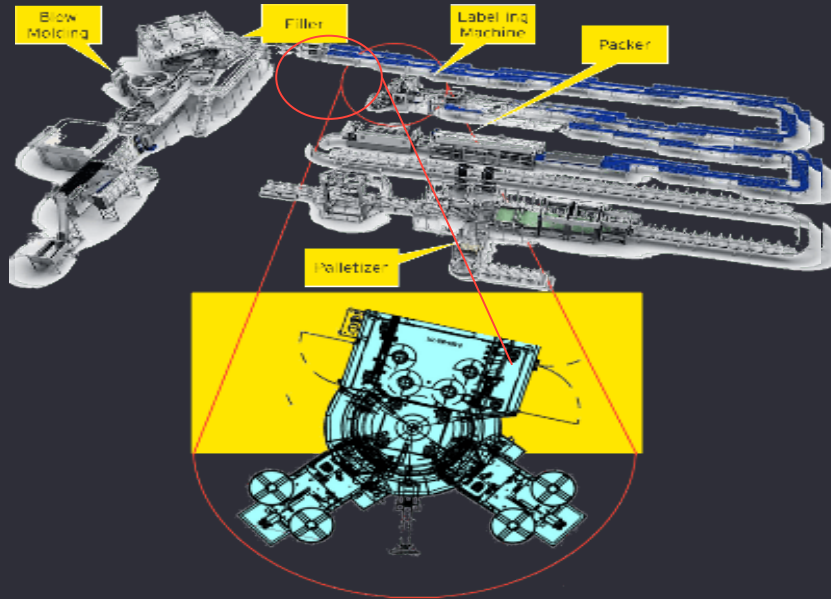
Predictive maintenance via a digital twin

CBPM (Condition Based Predictive Maintenance)

- **Monitors** in real-time the equipment's performance against critical parameters
- **Machine learning (AI)** determining behavior of the equipment under different conditions
- **Automatically alerts** when equipment runs outside desired targets to enable early intervention
- **Predicts failure** based on how the equipment is being run and its current condition
- **Better scheduling** of Planned Maintenance based on actual equipment condition



Smart Maintenance Management applications with dashboards acting as warning flags

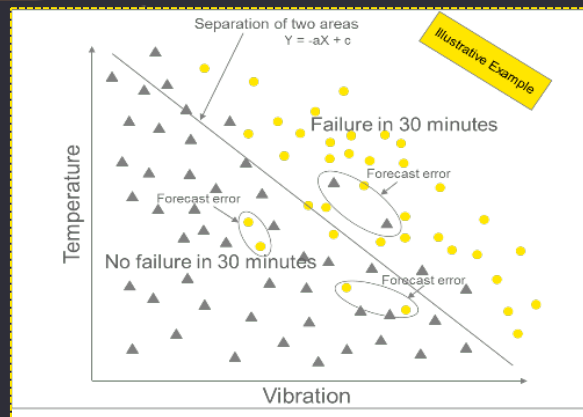


Condition-based Maintenance

- ▶ Data-driven continuous machine monitoring
- ▶ Deviation triggers intervention
- ▶ Reduce unplanned downtimes and ad-hoc maintenance

Predictive Maintenance

- ▶ Correlate historic data with machine conditions and maintenance requirements
- ▶ Setup analytics/ machine - learning model to predict future requirements and performance



Use of AI & AR as part of ad-hoc solutions for critical activities & equipment

Augmented reality & sensors for breakdown visualization



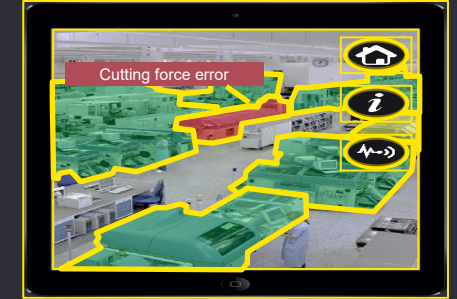
Virtual work instructions for service or maintenance



Real-time capturing of maintenance order information



Deviations are visualized on several devices



- ▶ Smart maintenance is focused on improving **reliability** and **OEE** while decreasing life-cycle cost
- ▶ Breakdowns are **predicted**, defective parts are identified & pulled from assembly lines and replacement orders placed
- ▶ Augmented Reality and Artificial Intelligence tools can be revolutionary **solutions** for specific maintenance related challenges

Key Take Aways

- ▶ Build the Core **Strategy** for an organization in order to fulfil the compelling business needs and targets
- ▶ Create the 3-year **framework** around which this strategy will be realized
- ▶ Implement IWS Continuous Improvement methodology, to create the **zero-loss** culture
- ▶ Utilize the right **Industry 4.0** tools of advanced technology, based on the maturity level or for ad-hoc solutions

THANK YOU

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