



# MANUFACTURING EXECUTION SYSTEM

Critical Manufacturing MES, a comprehensive, proven and innovative software suite, empowers operations to move into future visions such as Industry 4.0. Compete better today - and tomorrow.

EMPOWERING OPERATIONS

# MANUFACTURING EXECUTION SYSTEM



## Why MES?

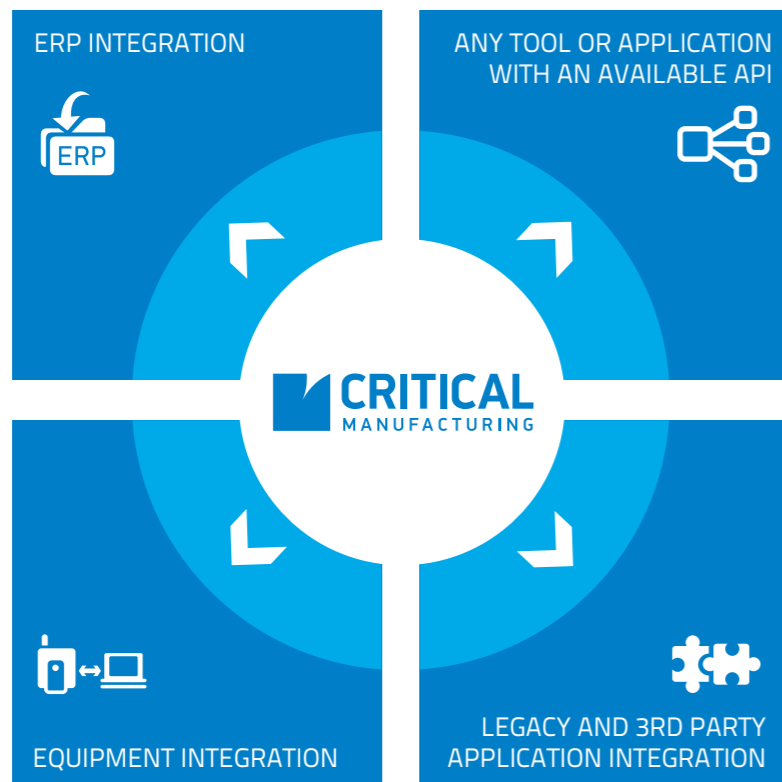
The business gains:

- Single, integrated view of production data for improved decision-making.
- Live up-to-the-minute visibility and control of production processes.
- Support for continuous improvement analysis, tracking and execution.
- Enterprise information flows among MES, ERP, PLM, SCM to simplify and automate processes and reduce risk.

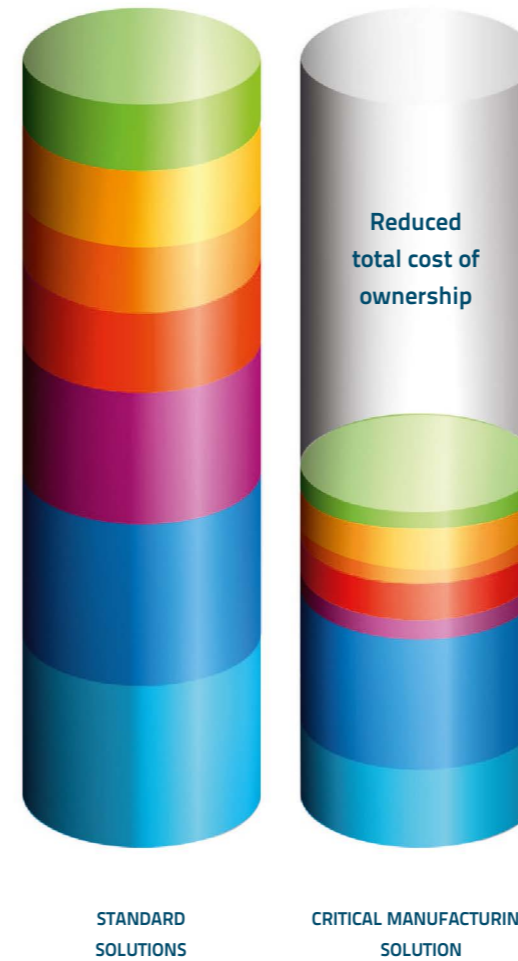
## Why Critical Manufacturing?

Manufacturers of complex, high tech discrete products get a manufacturing execution and intelligence system that empowers the organization to achieve its goals. Critical Manufacturing MES:

- Scales to mirror growing operational needs.
- Drives visibility of production and costs across the supply chain.
- Implements rapidly on an existing infrastructure.
- Accommodates IIoT-enabled production marketplace for smart factories.
- Enables users to quickly learn and do their job from any location.



Low total cost of ownership (TCO)  
Through reduction of all cost factors



### ADMINISTRATION

Single IT stack, with powerful admin tools  
Application admin through a unified GUI

### MODELING

Rich, pre-customized object model  
Modeling through the same GUI  
Empowered end-users

### USABILITY

User training time lower than ever  
Process enforcement even on mobile  
Unique screens that upgrade

### INSTALLATION

Server side full installer ready in minutes  
No client installation

### 3RD PARTY LICENSES

100% Microsoft Technology  
No hidden costs

### SOFTWARE

Scalable pricing model, based on size  
Modular functionality

### HARDWARE

Scalable HW based on needs  
From single server to full fault-tolerant, high-available configuration

FROST & SULLIVAN

Critical Manufacturing is proud of its designation by Frost & Sullivan as a global value leader in the MES industry leader for its low total cost of ownership, features and ease of use.

Global Price Performance  
Value Leadership Award

# FACTORY MANAGEMENT | CORE

# SCHEDULING

## ENSURE A MODULAR, YET FULLY INTEGRATED MANAGEMENT OF SHOP-FLOOR RESOURCES



**MATERIALS & CONTAINERS**  
Hierarchical material model for flexible tracking and traceability. Positional containers. Bill of materials.



**RESOURCE AND DURABLES TRACKING**  
Resource and durables management. Integration with Recipe Management, Maintenance, Exceptions and Data Collection modules.



**DATA COLLECTION**  
Flexible, scalable and automated data collection that is fully integrated with Statistical Process Control and Exceptions Management modules.



**SCHEDULING**  
Generate individual resource schedules and enforce processing sequences optimizing production KPI's using multiple weighed optimization criteria.



**ROUTING AND DISPATCHING**  
Service-oriented, hierarchical resource and material dispatching with customizable rework paths.



**MASTER DATA MANAGEMENT**  
Versioning, approval cycles for critical objects, master data management and master data loaders.



**CHECKLISTS**  
Mandatory or optional, sequential or floating multi-step checklists with defined parameters and tracking integrated with manual or automatic rules.



**DASHBOARDS**  
Graphic access to material, resource or other user defined query to chart and report on process data enabling users to fulfill custom business requirements.



**REPORTS**  
Create, edit and publish highly-granular reports based on the online database, the operational data store or any other external database.



**OPERATIONAL DATA STORE**  
Online database offloading and mid term data repository from different sources, used as the primary source of reporting.



**DATA MINING**  
Advanced data mining algorithms and analysis, including time series, decision trees and neural networks.



**MOBILE**  
Visualize in real time fab layouts, dashboards and other information from mobile devices.

# QUALITY

## PRODUCT LIFE-CYCLE MANAGEMENT, PROCESS CONTROL AND QUALITY IMPROVEMENT MODULES



**STATISTICAL PROCESS CONTROL**  
Variable and attribute charts, integrated with data collection, exceptions, resource and material tracking. Western Electric and user defined rules.



**EXCEPTIONS MANAGEMENT**  
Manual or automatic user defined exception protocols linked to EDC limits and SPC rules and linked to process checklists.



**SAMPLING**  
Define and execute time and counter based sampling based on flexible contexts. Flexible rules for in-step sampling (to select which sub-materials to measure).



**DOCUMENT MANAGEMENT**  
Visualize, control and approve shop-floor related documents within MES context and at the right operation.



**ELECTRONIC FAILURE CATALOG**  
Browse through applicable failure high-resolution images to classify and select loss codes.

# VISIBILITY & INTELLIGENCE

## ADVANCED MODULES FOR ONLINE VISIBILITY AND TRACEABILITY AND OFFLINE ANALYSIS



**FABLIVE**  
Fab layout tool with overview and zoom-in capabilities for historical and real-time trending and analytical reports.



**DATA WAREHOUSE**  
Multi-dimensional data warehouse, with advanced slicing and dicing OLAP operations.



**ALARM MANAGEMENT**  
Mechanism to send and view notifications about events requiring user attention, with user-defined scope and clearing traceability.



**ADVANCED LAYOUT & PRINTING**  
Design, preview and print labels and lot travelers with context driven information for text, images or barcodes.



**DATA EXTRACTOR**  
Intelligent, automated multi-source data extraction and analysis capabilities.

# OPERATIONAL EFFICIENCY

## OPTIMIZATION AND EFFICIENCY INCREASE SHOP-FLOOR MODULES



**ORDER MANAGEMENT**  
Provides the means to track and manage the fulfillment of production orders from a shop-floor perspective.



**COSTING**  
Real-time shop-floor costing control through cost absorption (labor, equipment and materials).



**LABOR MANAGEMENT**  
Management of certifications and qualifications. Shift planning for assignment and scheduling of employees, teams and shifts.



**MAINTENANCE MANAGEMENT**  
Ad-hoc, time and usage based maintenance management integrated with Material and Resource Tracking, Data Collection and SPC modules. Includes parts and checklists.



**WAREHOUSE MANAGEMENT**  
Manage request and return of materials between the shop-floor and the warehouse.

# INTEGRATION & AUTOMATION

## PRODUCTIVITY PLATFORM FOR AUTOMATION AND INTEGRATION



**MAPPING**  
Collect, edit and visualize large two-dimensional material maps (such as wafer maps) and synchronize quantities with material tracking.



**RECIPE MANAGEMENT**  
Recipe parameters and context resolution integrated with resource and material tracking and equipment integration.

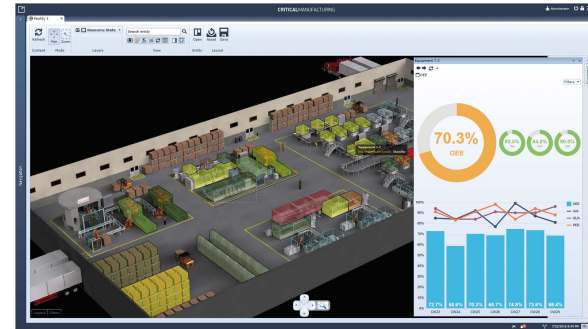


**ERP INTEGRATION**  
Flexible ERP integration (SAP, MS, etc.) for production orders, inventory status updates, master data and maintenance with synchronous or asynchronous communication in the event of ERP downtime.



**CONNECT**  
Full point-and-click equipment integration platform connecting enterprise software (SECS/GEM, OPC, PLC, File, Database, LIMS) with Critical Manufacturing or other MES, including service and message mapping.

Empowered end-users  
Next generation user experience



Critical Manufacturing is simpler, faster and easier than any other MES on the market.

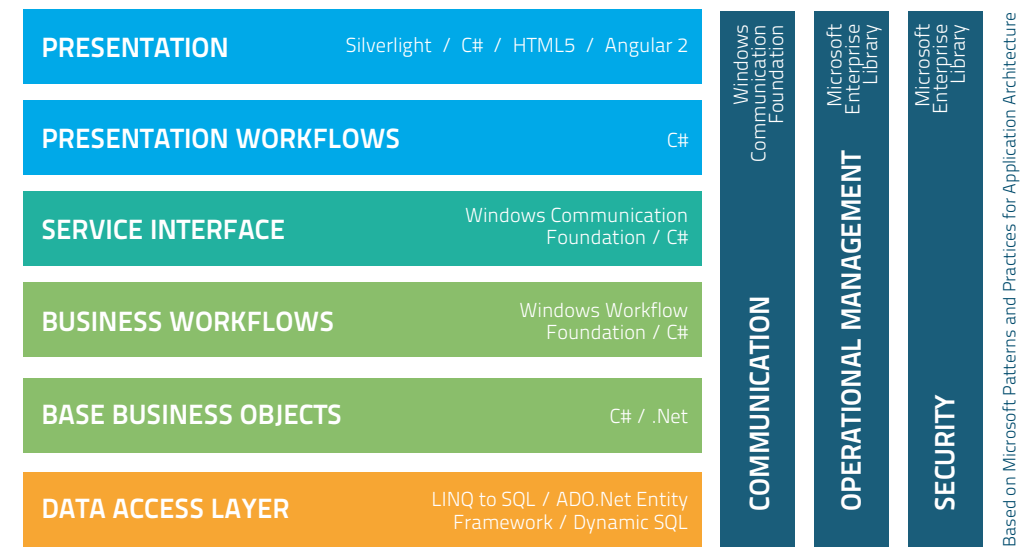
Users can create sophisticated graphical user interfaces (GUI):

- Straightforward drag and drop technology
- No need for complicated coding
- Total flexibility

Generate personalized views quickly for a process to suit an operator or maintenance personnel's individual needs.

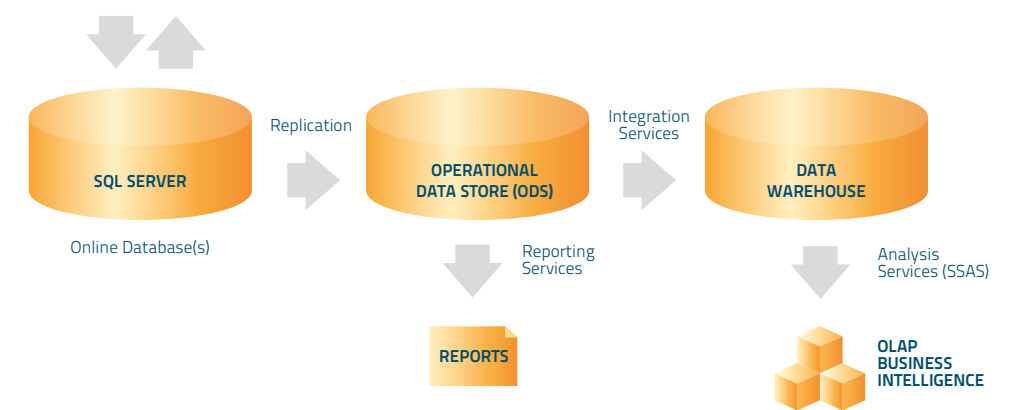
Web based interface is able to run on multi platform and multi form size devices.

Fully integrated modular system  
Flexible, scalable and extensible at all tiers

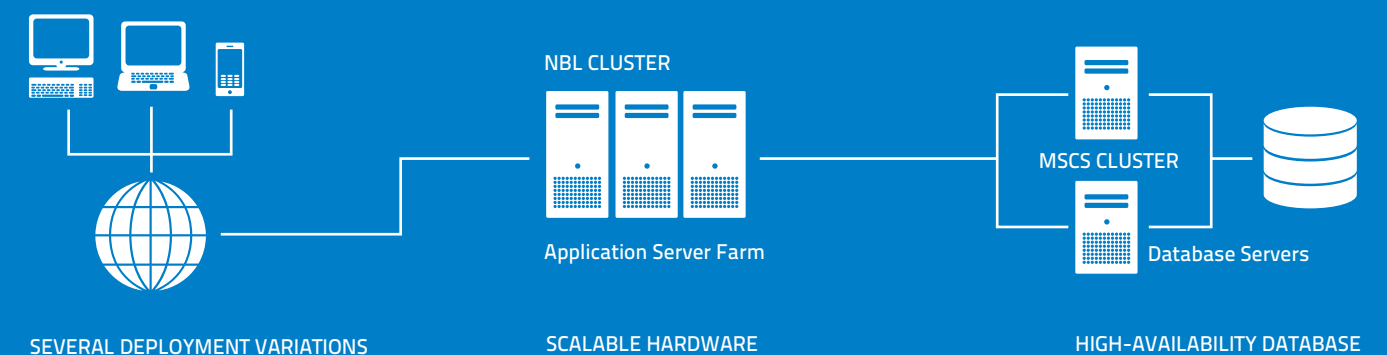


Microsoft Partner  
Gold Application Development

Based on Microsoft Patterns and Practices for Application Architecture



Hardware reliability, scalability and performance  
Designed to be customizable across the three tiers



SEVERAL DEPLOYMENT VARIATIONS

SCALABLE HARDWARE

HIGH-AVAILABILITY DATABASE

PRESENTATION TIER

- Add ribbon actions
- Create addins
- New GUIs

BUSINESS TIER

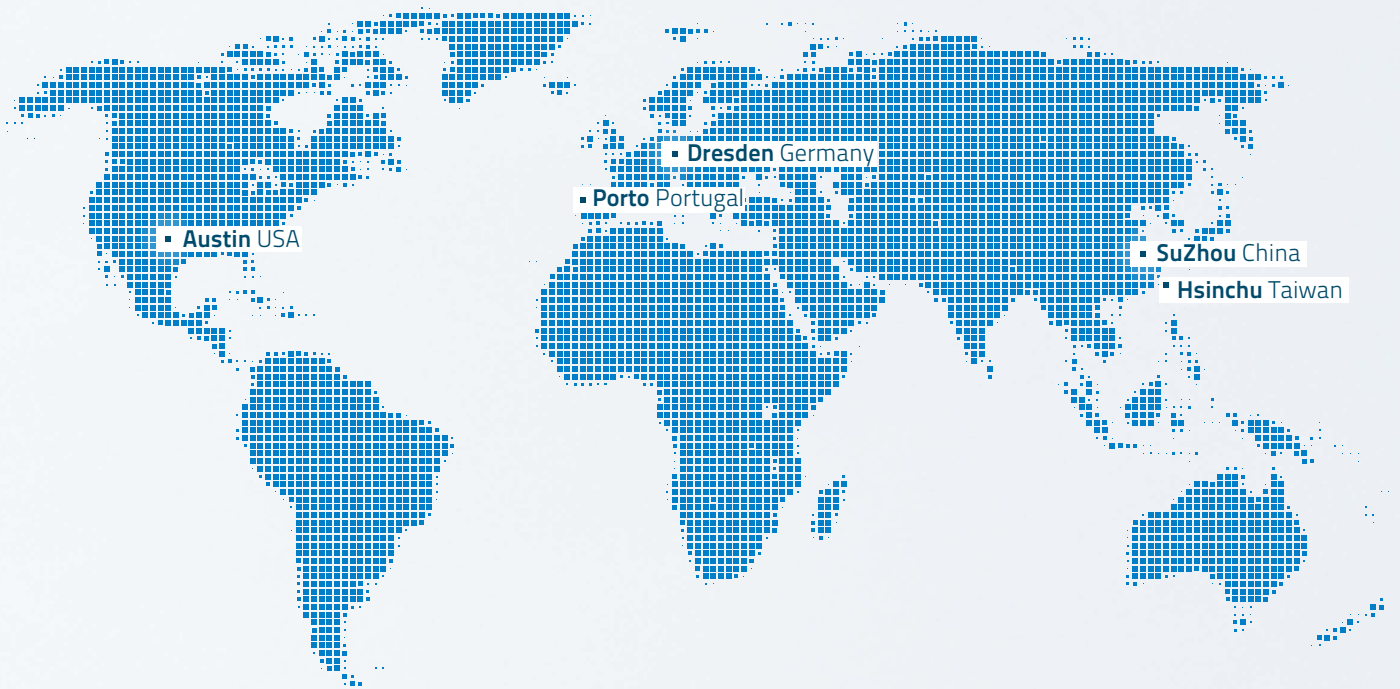
- Dynamic business rules
- Custom entities
- Custom services

ANALYTICS TIER

- Reports
- Cubes
- Data sources

Manufacturing & R&D  
America, Europe and Asia

[www.criticalmanufacturing.com](http://www.criticalmanufacturing.com)  
[contact@criticalmanufacturing.com](mailto:contact@criticalmanufacturing.com)



Critical Manufacturing empowers high performance operations for some of the most advanced manufacturers worldwide. Its MES is a deep, unified Industry 4.0 centerpiece. The company is part of Portugal-headquartered Critical Group.

#### Critical Group

Provides business critical solutions across industries such as aerospace, defense and telecommunications, under stringent quality certifications like NATO and CMMI Level 5.

#### Experience

Our engineers provide solutions for some of the most challenging MES green-field and migration projects worldwide. Their experience is at your service.

#### Innovation

Our solutions address the most important industry challenges through cutting-edge innovative products and technologies.

#### Industries served

- Semiconductors
- Solar
- Electronics
- Medical Devices
- Automotive
- Other industries

COMPETE  
2020

PORTUGAL  
2020



UNIÃO EUROPEIA  
Fundo Europeu  
de Desenvolvimento Regional