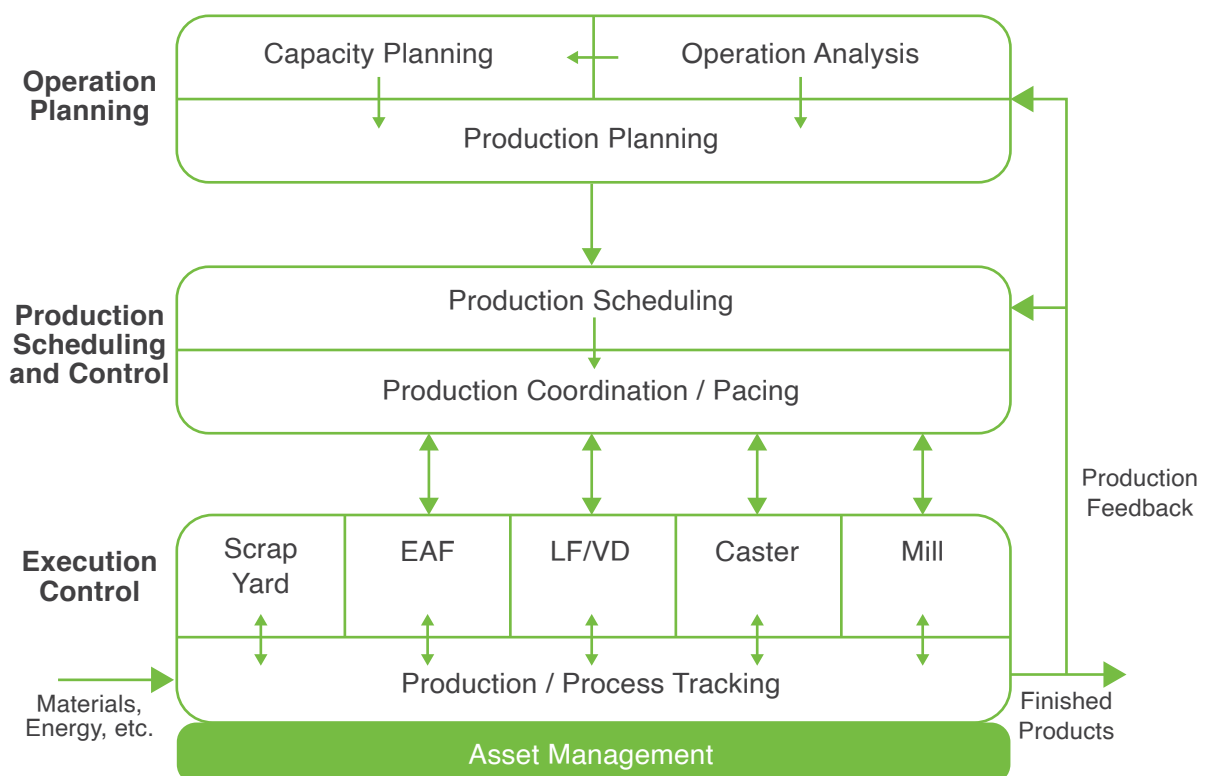# MES.AI
Manufacturing Execution Systems

MES.AI

MES.AI is a complete, fully integrated, package that can start from capturing Customer Orders to the delivery of Products, while tracking material used, plant/process performance, asset usage, quality and cost, to produce finished products.

- ▶ Tracks all elements involved in production
  (Products, Quality, Consumables, Process, Assets)
- ▶ Controls production by dynamically optimize the Production Schedule
- ▶ Learns from history – Integrated Machine Learning (AI) tools
- ▶ Optimize core models from learned history

Operation Planning

Capacity Planning — Operation Analysis

Production Planning

Production Scheduling and Control

Production Scheduling

Production Coordination / Pacing

Execution Control

| Scrap Yard | EAF | LF/VD | Caster | Mill |

Production / Process Tracking

Asset Management

Materials, Energy, etc.

Production Feedback

Finished Products

Execution Control System

This system tracks, controls, learns and optimizes the execution of the production:
- ▶ Implements Individual process modules for all processes
  (Furnaces, Casting, Finishing Lines)
- ▶ Tracking modules track:
    - Product production within processes
    - Products between processes (heats, slabs, billets...)
    - Assets (use, inventory, life, performance…)
- ▶ Control modules at all levels, from a single process to plant-wide production
- ▶ Learning Modules collect relevant information to learn from it (applying AI tools)
- ▶ Optimizing Modules applies "learned" information to existing control modules

Production Scheduling & Control System

This system controls the production by tracking and optimizing the schedule of orders:
- ▶ Groups customer orders into production orders that are optimum for each process
- ▶ Plan when orders should be produced maximizing the production capacity
- ▶ Schedule (sequence) orders for production that maximizes production output
- ▶ Tracking orders as they are produced
- ▶ Learn by collecting relevant information to scheduling
- ▶ Optimize (dynamically) a production schedule once in production according to real-time conditions

Operation Planning System

This system helps plan the whole plant operation
- ▶ Schedule down-time for processes (maintenance)
- ▶ Determine what products and how much to produce (more profitable products)
- ▶ Determine materials/consumables to buy (considers value-in-use)
- ▶ Learning Module determines the Performance of:
    - The overall plant
    - Each process
    - Each product (heats, slabs, billets, coils…)
    - Each material
    - Each crew, etc.
- ▶ Optimizes the models used for planning with information "learned"

Execution Control System   Production Scheduling & Control System   Operation Planning System