

Software defined Configuration Management in Manufacturing

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GRAYMATTER

TOD VIRDEN

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Tod spent 13+ years with General Electric (Lighting, Healthcare and Transportation) and is now currently Mfg Solution Architect at GrayMatter where he helps customers connect the dots and facilitate true digital transformation.



WHO WE ARE



CONSULTING

We're an OT services-first company that starts with your problems and applies design thinking and agile practices to help you solve them.



IMPLEMENTATION

We help people and industrial assets become smarter and more visible.



TECH CURATION

We focus on curating the best processes and technologies to drive industrial intelligence transformations.

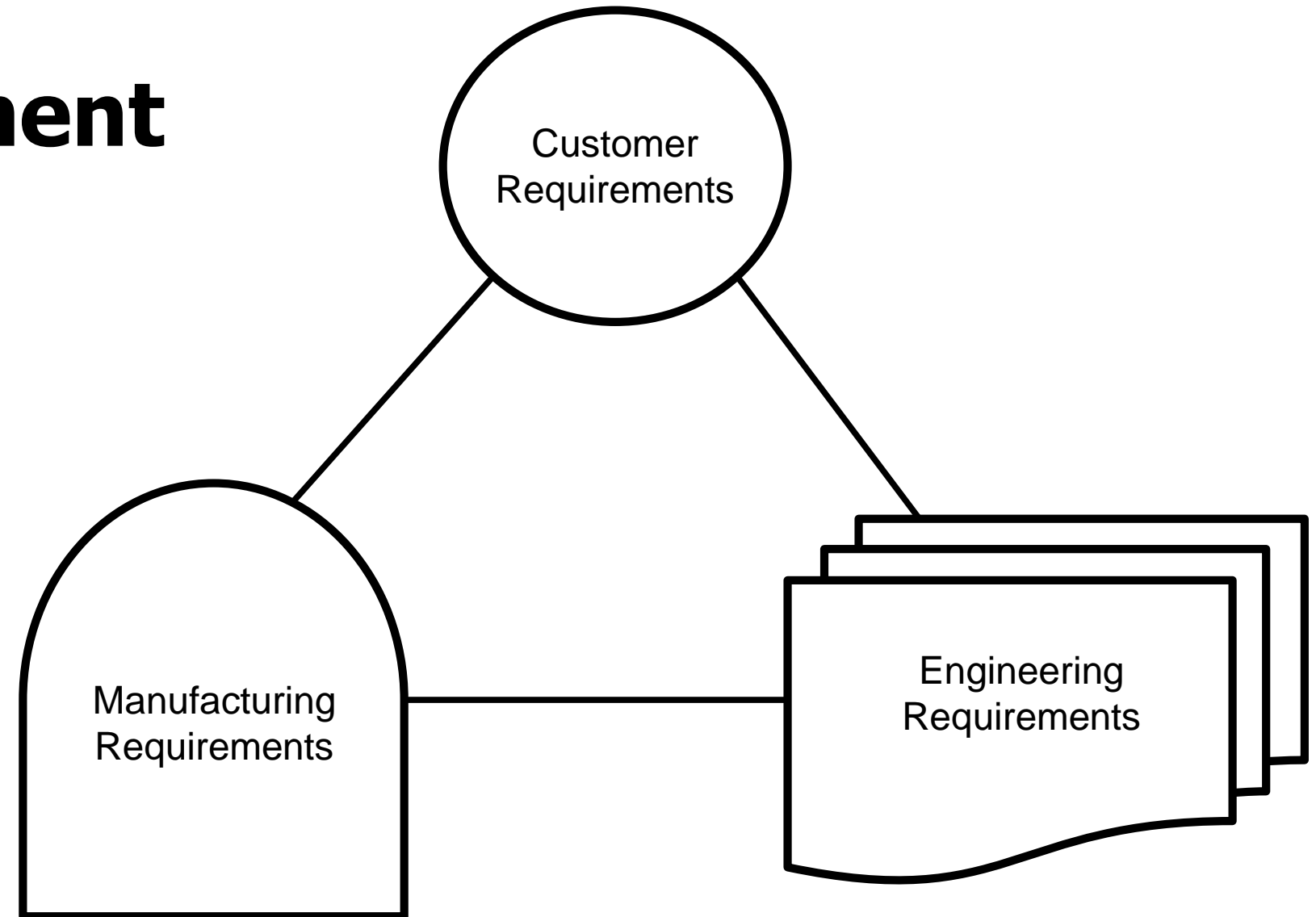


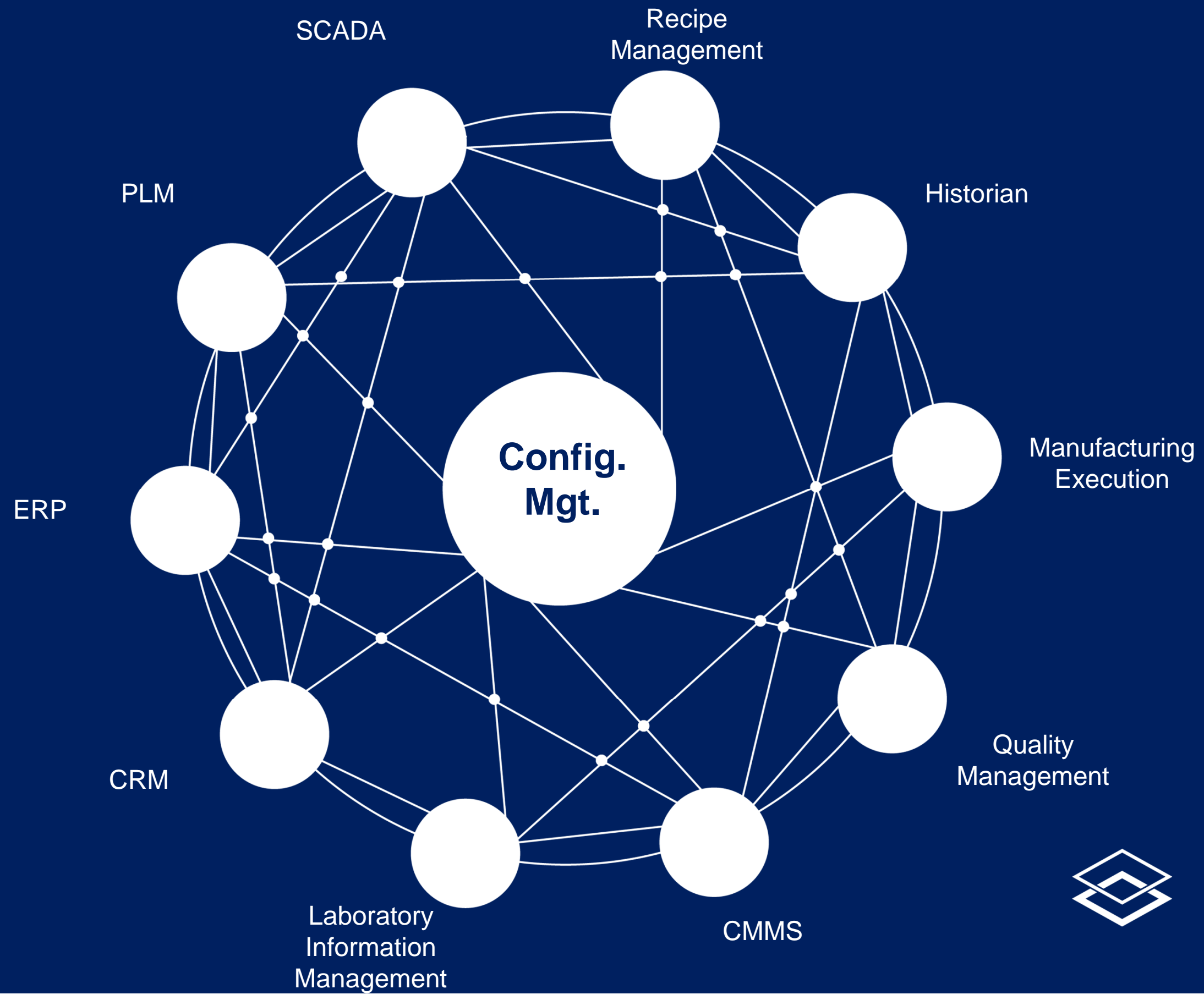
AMERICA'S
FASTEST
GROWING
PRIVATE
COMPANIES



Configuration Management in Manufacturing

To manage the many aspects of manufacturing products each role / function typically has their own software platform / suite with specific capabilities to ensure the highest product quality that meets the customers requirements



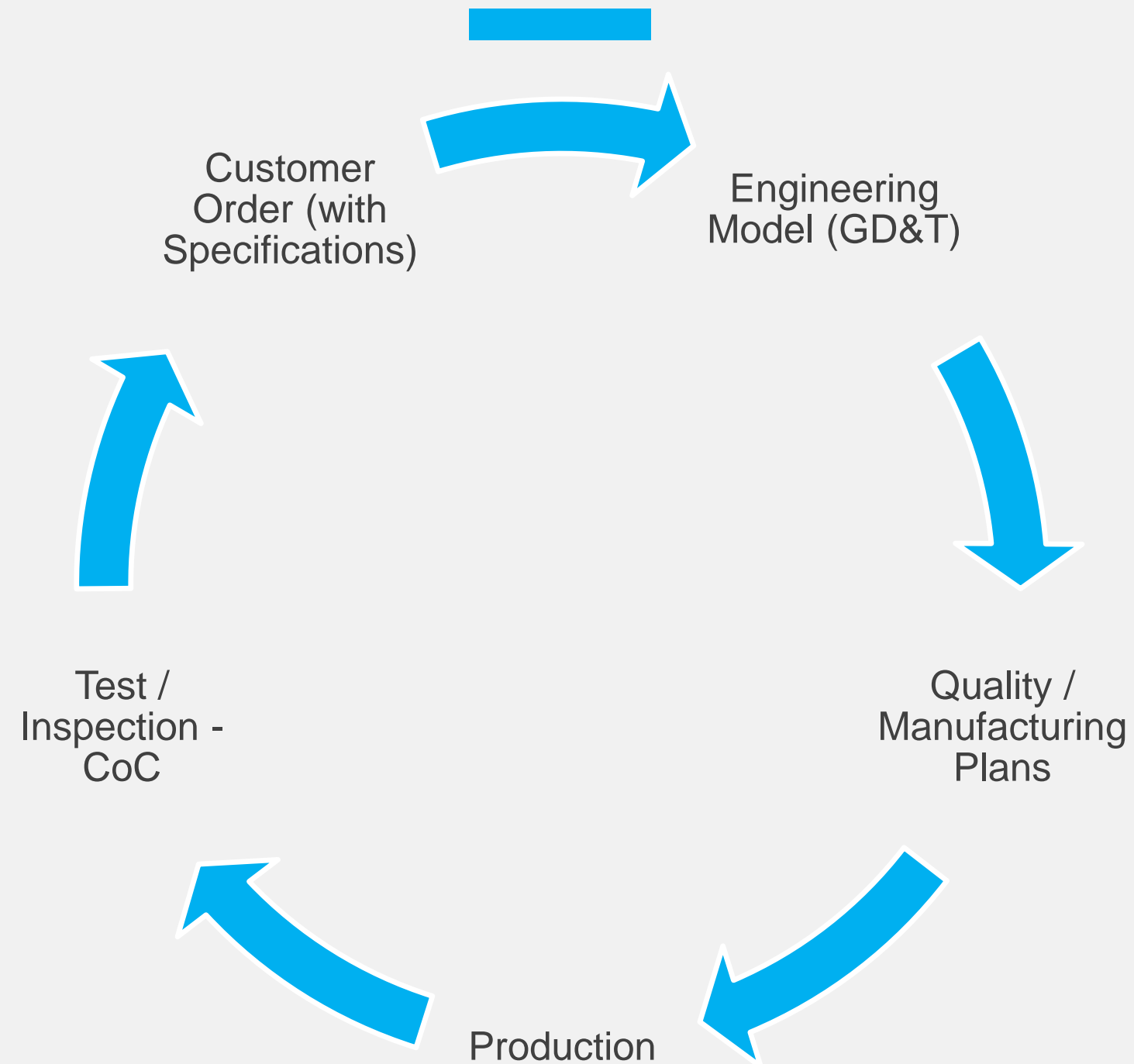


Software by Role

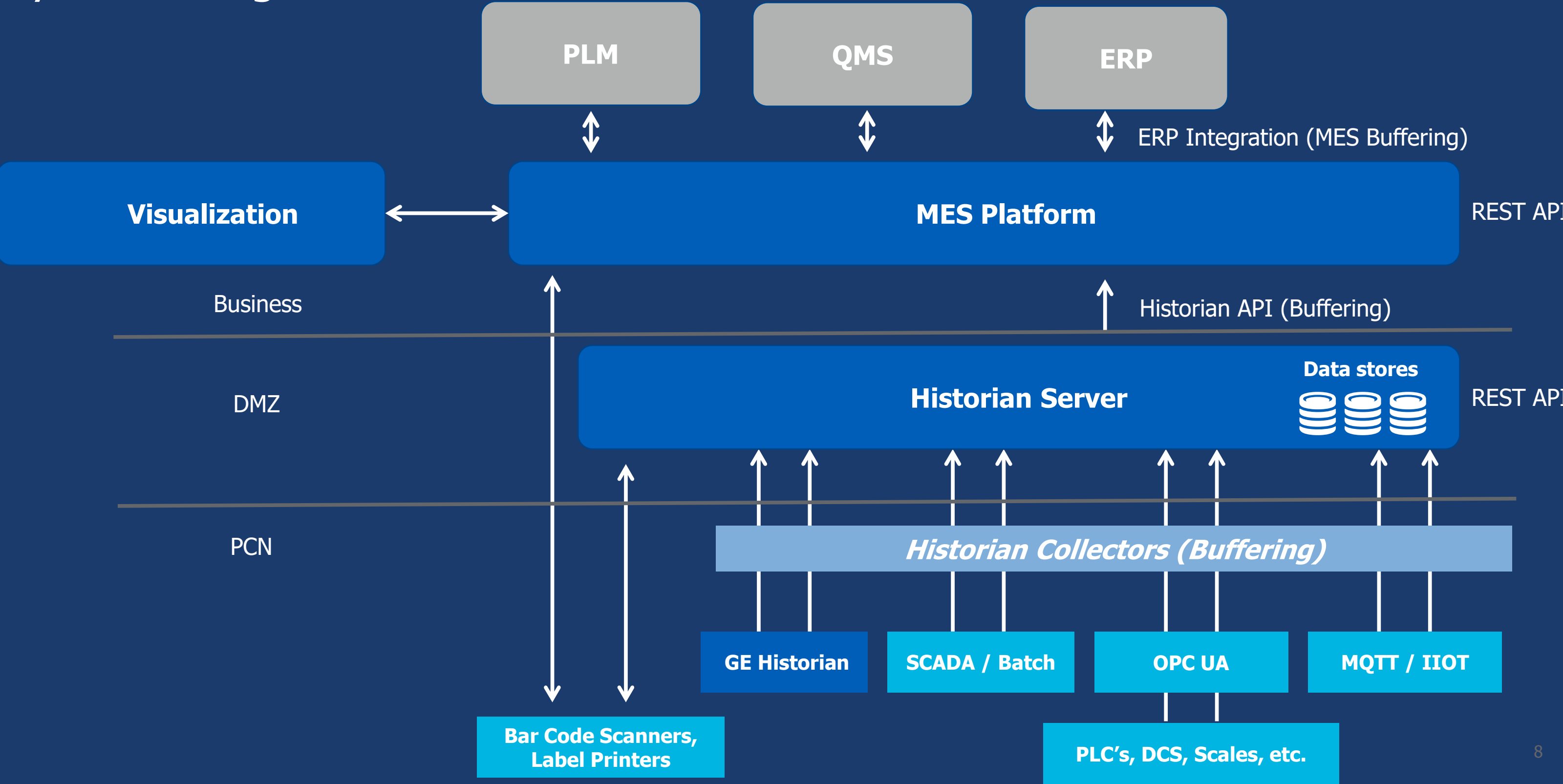
Software	Function	Functional Users
CRM	Customer information	Sales / Marketing
ERP	Material info, Order Info	Finance
PLM	Product Specifications, 3D Model	Product Management / Design Engineers
MES	Manage execution of shop floor process work and data collection	Plant Operations Leadership and Operators
QMS	Product Specifications, Manufacturing Instructions	Quality Organization
LIMS	Track laboratory tests relative to a product	Lab Technicians / Quality Assurance
SCADA	Control manufacturing Process	Plant Operators



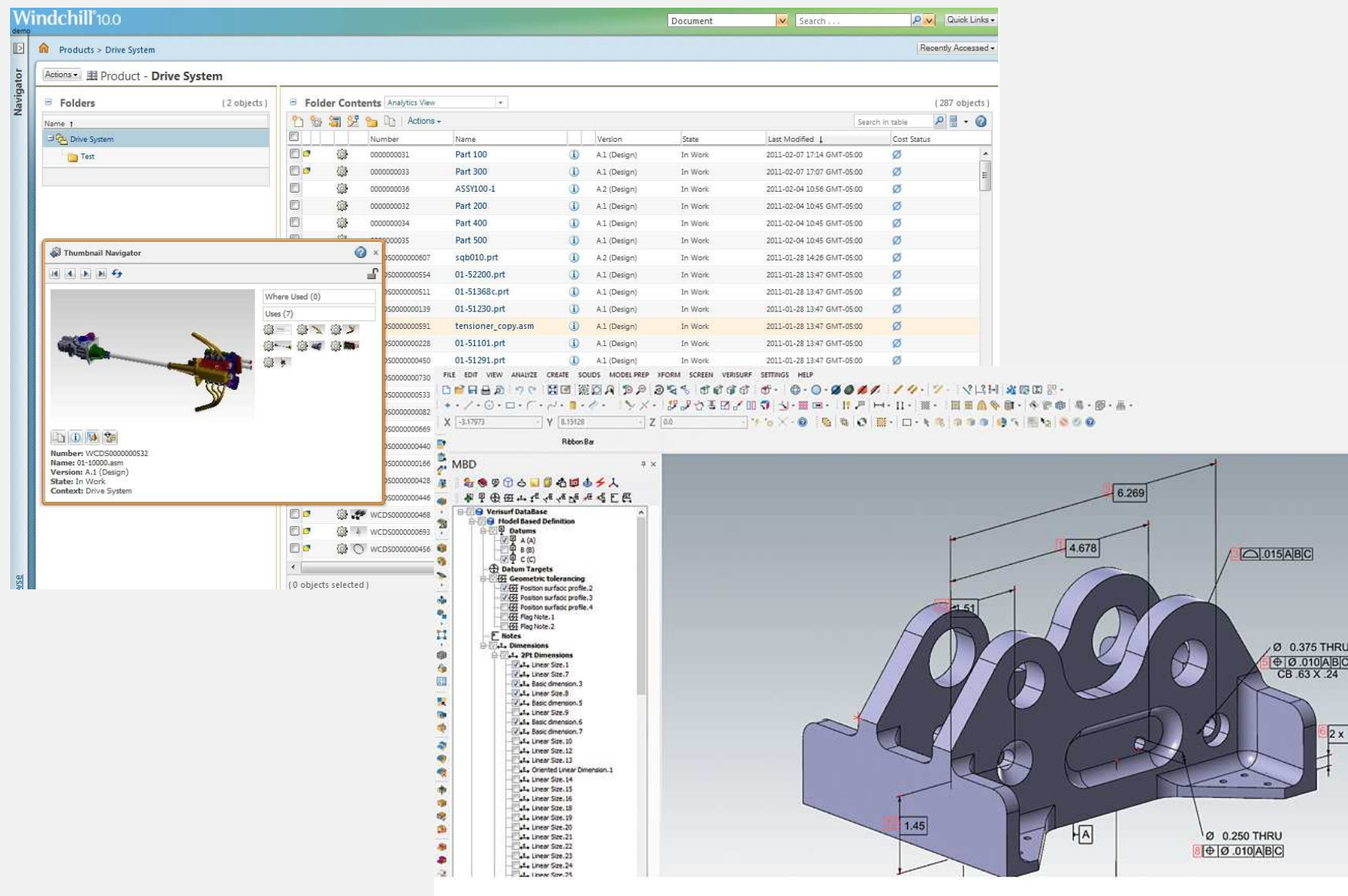
Product lifecycle in digital systems



System Integration



3D Modeling / PLM



Transform customer requirements
into manufacturable requirements
Create and Track changes to models
Apply GD&T information
Route models and requirements for
approval
Manage revisions



Example of an MES

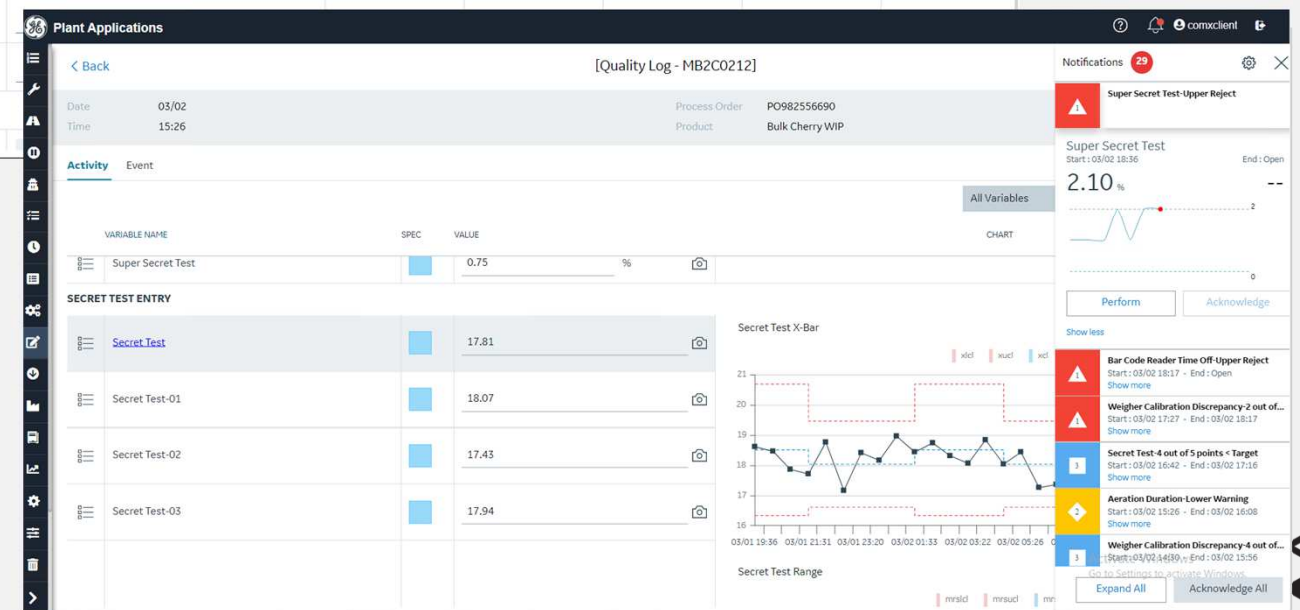
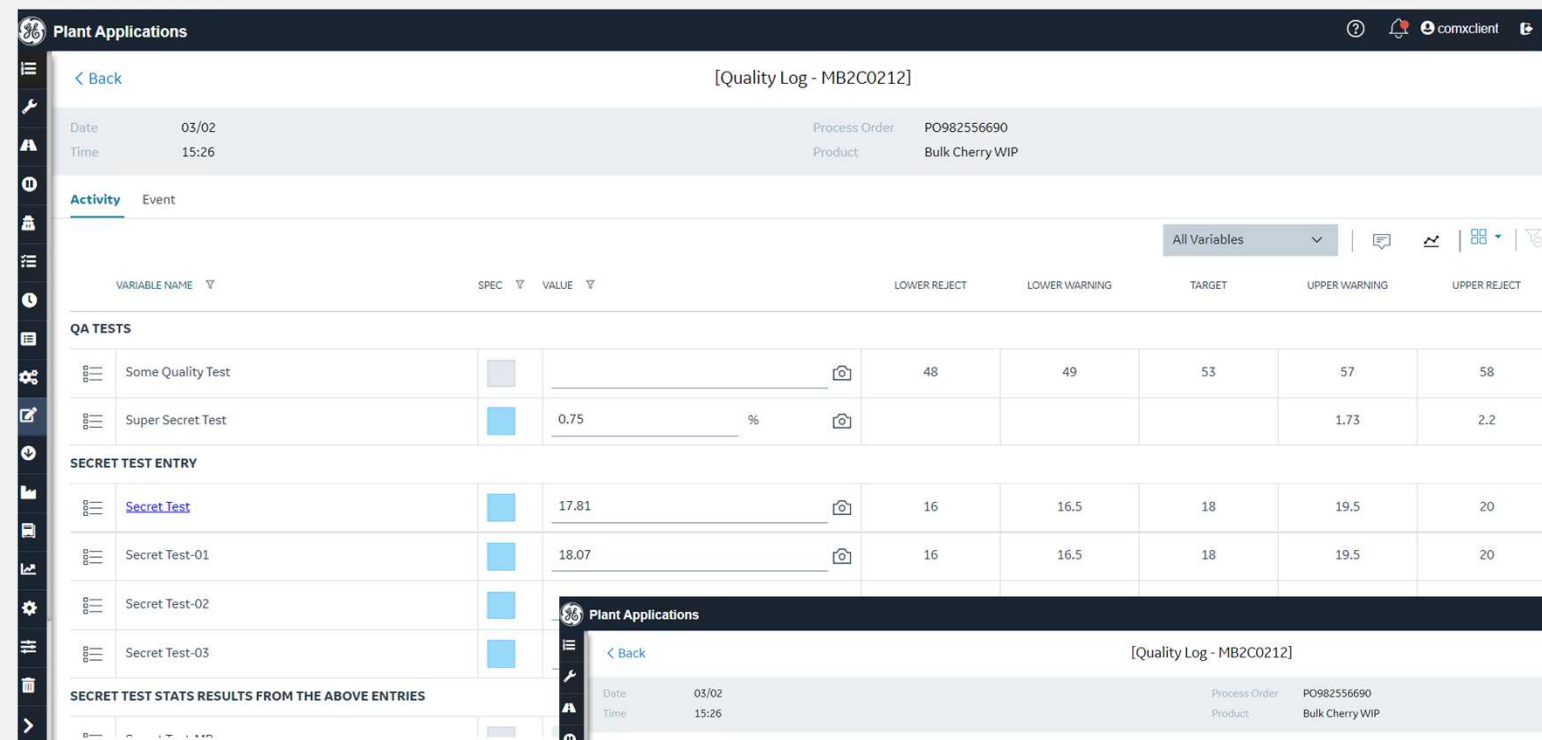
Order #, Bill of material, item attributes, Quality specs, Etc all sent in from other systems

Guide operators through the manufacturing process

Collect critical quality parameters and compare in real time to specifications

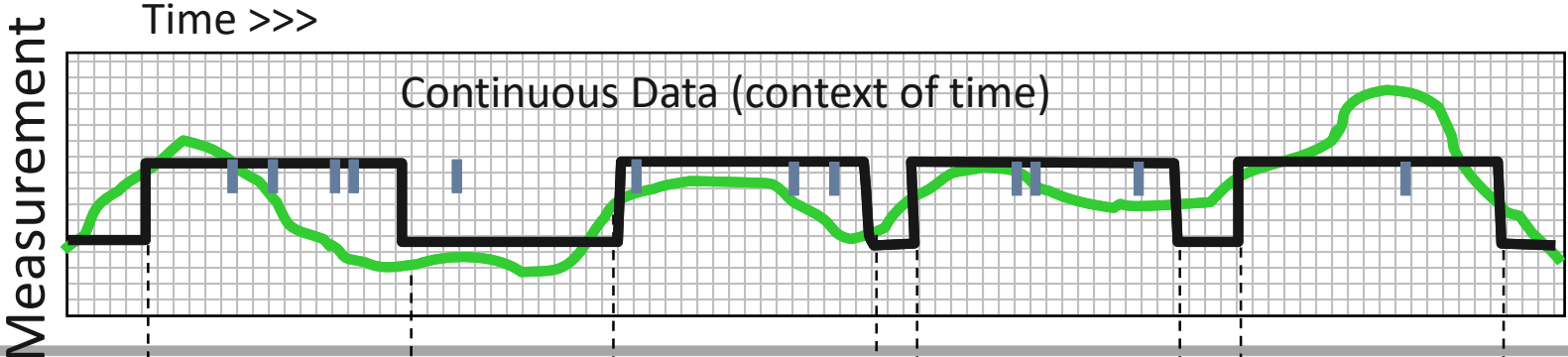
Generate CoC / CoA

Report back to other business systems



MES derives “information” from “data”

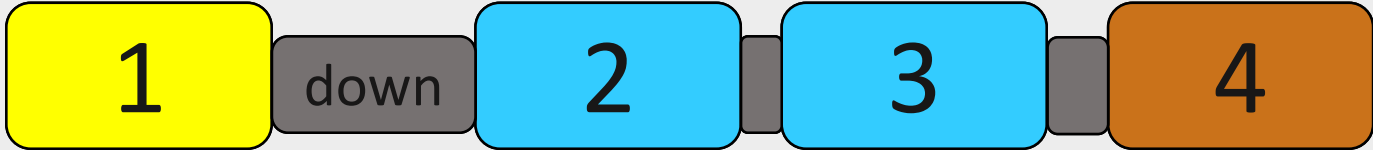
Historian:
Raw data from sensors



Aggregations in various contexts

Average, Total, Min, Max, etc. Average, Total, Min, Max, etc. Average, Total, Min, Max, etc. Average, Total, Min, Max, etc. Average, Total, Min, Max, etc.

MES:
Info about events



- Identifies Production Events (ex: part, item, lot, batch)
- Detects & interprets downtimes, product changes, waste, etc.
- Provides Business Contexts: (Product, Grade, Crew, Order, Customer, disposition, etc..)
- Collects QC lab and other measurements
- Assesses conformance to specs and recipes
- Alerts where good or bad
- Captures reasons



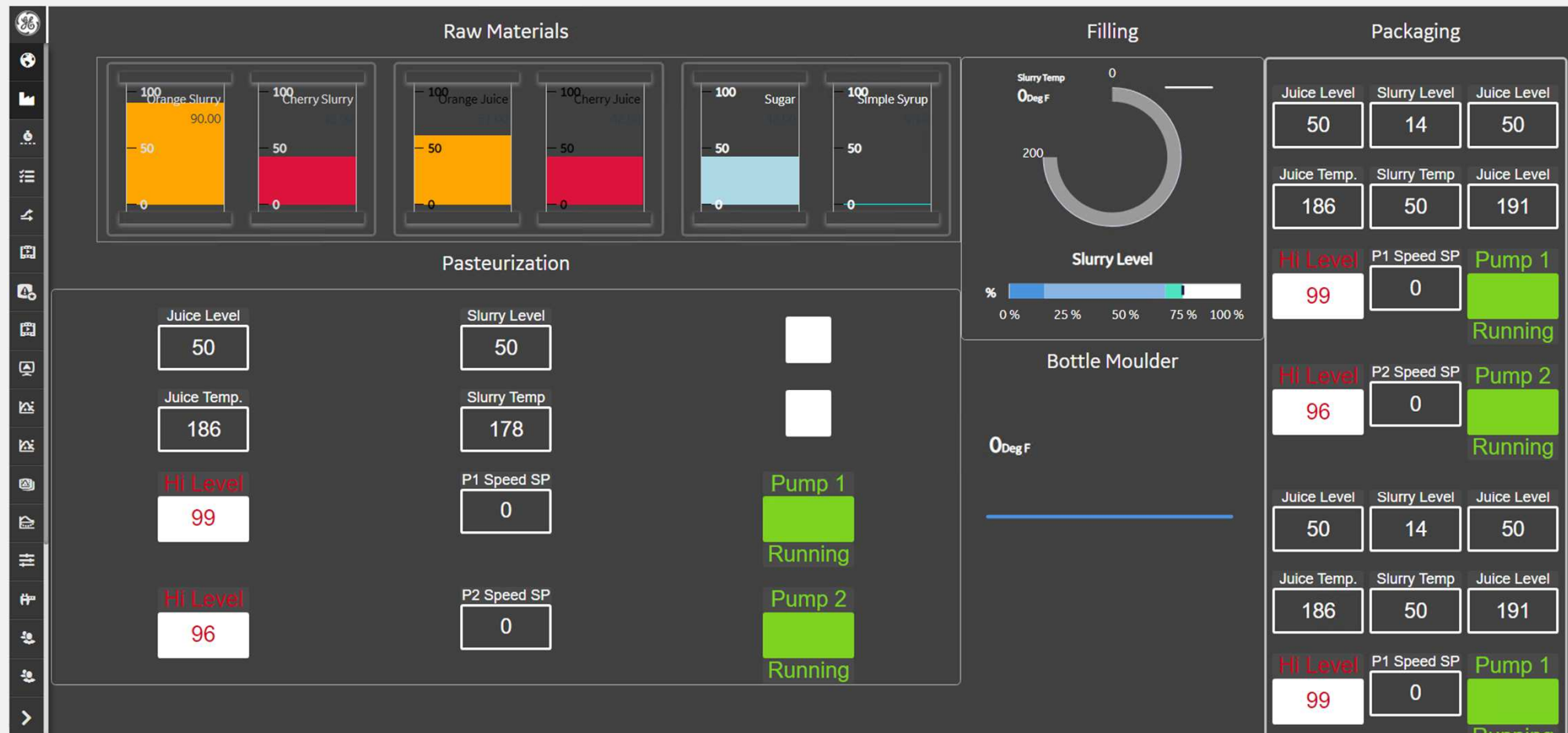
Business Systems:
ERP, PLM, WMS, CMMS/EAM



Minimize information work. Maximize Information usefulness.

Example of SCADA

- PLC / Recipe setpoints
- Realtime indication of status
- PLC / DCS Control
- Intuitive at-a-glance visualization
- Realtime alarming





CASE STUDIES

Additional benefits of software in Mfg.

Major F&B

CHALLENGE

Client leadership wanted facility operators to receive timely data to help them optimize production. This meant creating an internal data analytics team and improving the quality and speed of relevant data collection to ensure operators quickly identify and address negative production trends.

SOLUTION

- Created Lighthouse and then did HyperDeploy
- Designed the genealogy strategy for one product line
- Integrated additional sites into the standard digital platform

BIG WINS

Initial installation at the one site produced **\$520K per year** in savings due to overtime elimination

Created standard Digital Platform for Manufacturing Data – focus on efficiency (OEE) and quality

Just consulted to create a new mobile operator strategy multiple high-margin product facilities; **12 more facilities** over the next fiscal year

Currently working with all plants across the company

#SUMMIT

#ROADMAP

#IGNITE

#LIGHTHOUSE

#HYPERDEPLOY

#ASSESSMENT

HILL'S PET NUTRITION

CHALLENGE

Hill's previously relied largely on lab product sampling to determine quality. This resulted in thousands of pounds of product each year "lost" directly to testing or to batches that were scrapped because they were produced before test results indicated a problem.

This cost more than \$1 million at a single facility per year.

SOLUTION

- **Data Visualization** - Data plots over custom time periods to help spot trends
- **Anomaly Detection** - System learns from months or years of data to flag problems and provides at least an hour of warning to allow workers to correct the issue
- **Machine Learning & AI** - Product quality models predict performance outcomes, reducing reliance on expensive, traditional sampling methods

#IGNITE

#LIGHTHOUSE

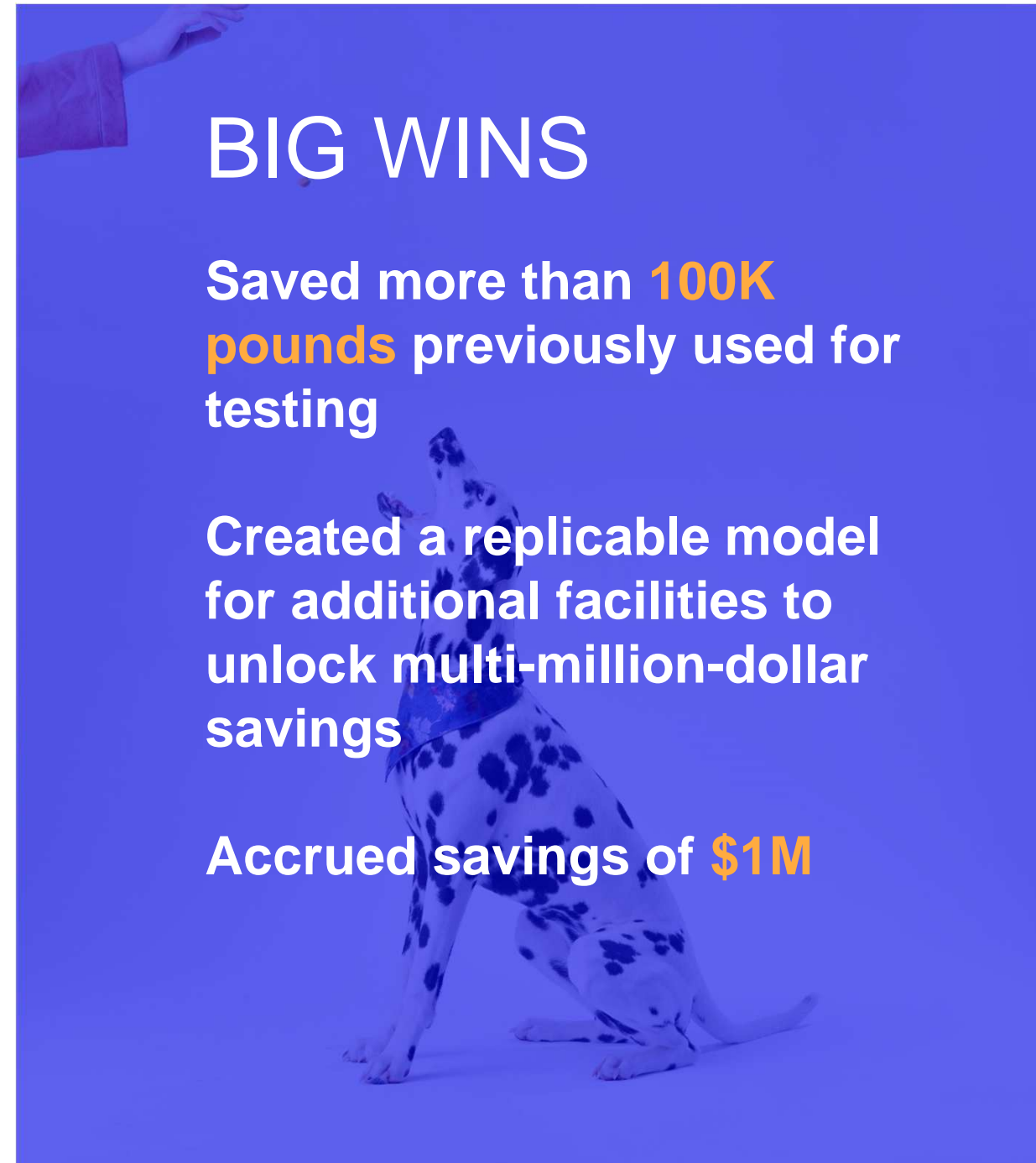
#HYPERDEPLOY

BIG WINS

Saved more than **100K pounds** previously used for testing

Created a replicable model for additional facilities to unlock multi-million-dollar savings

Accrued savings of **\$1M**



Q&A



THANK YOU!

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| GrayMatter | on LinkedIn

TRANSFORMING OPERATIONS | EMPOWERING PEOPLE



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