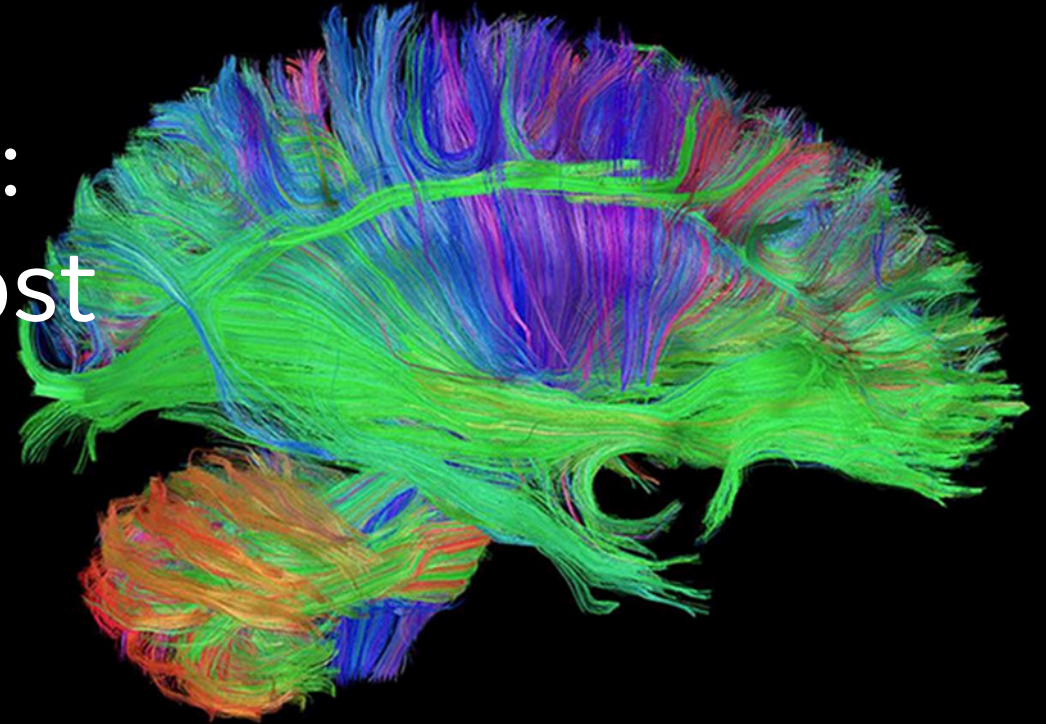


Pharmaceutical Manufacturing: Now is the right time to boost your digital health!

Dr. Bernard E. Cubizolles

Global Product Marketing & Strategy - Digital Plant

GE Digital





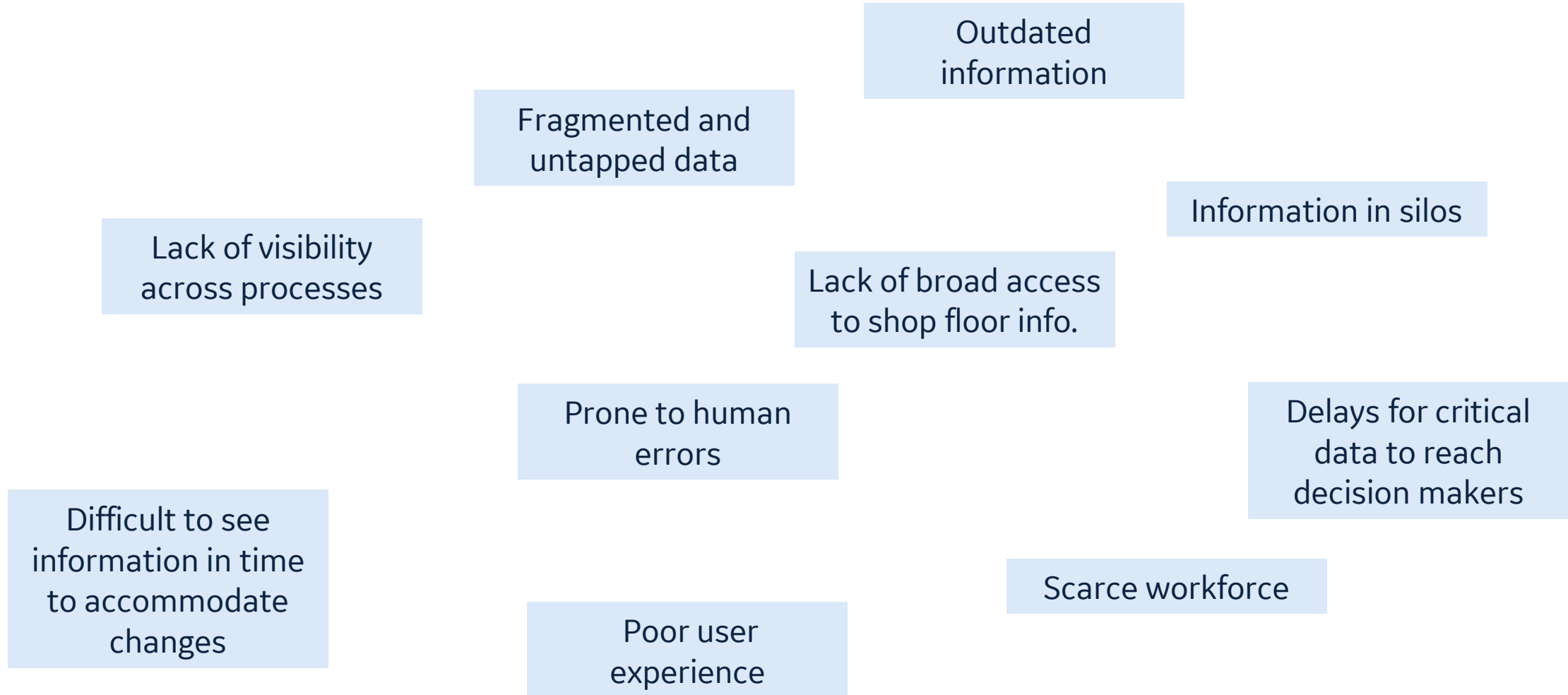
“

COVID-19 has prompted smart manufacturers to rethink their long-term factory designs and refocus on people.

”

Focus for Smart Factories turns
to Managing People, Gartner 2020

Digital Transformation: What's getting in the way?



Digital Transformation: What's getting in the way?



Outdated
information

Fragmented and
untapped data

Information in silos



Prone to human
errors

Poor user
experience

Delays for critical
data to reach
decision makers

Scarce workforce



Lack of visibility
across processes

Difficult to see
information in time
to accommodate
changes

Lack of broad access
to shop floor info.

Connected Worker & Operational Agility

More than the “Mobile Worker”

People first!

Choice of communication channels

Seamless access to information – anywhere, any time:

- Relevant data
- Human expert (SME)

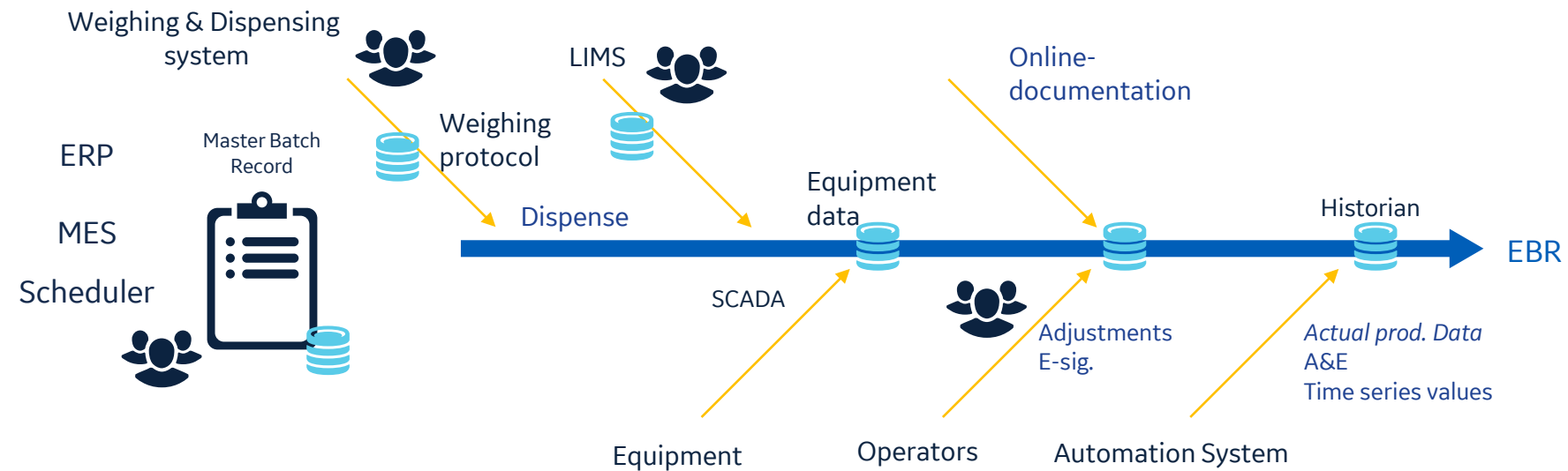
Consistent user experience – single pane of glass

HMI/SCADA | Proficy Operations Hub | Proficy MES | Proficy Workflow



The connected Worker
is an **efficient Worker**

EBR (Electronic Batch Record)



Heterogeneous data sources



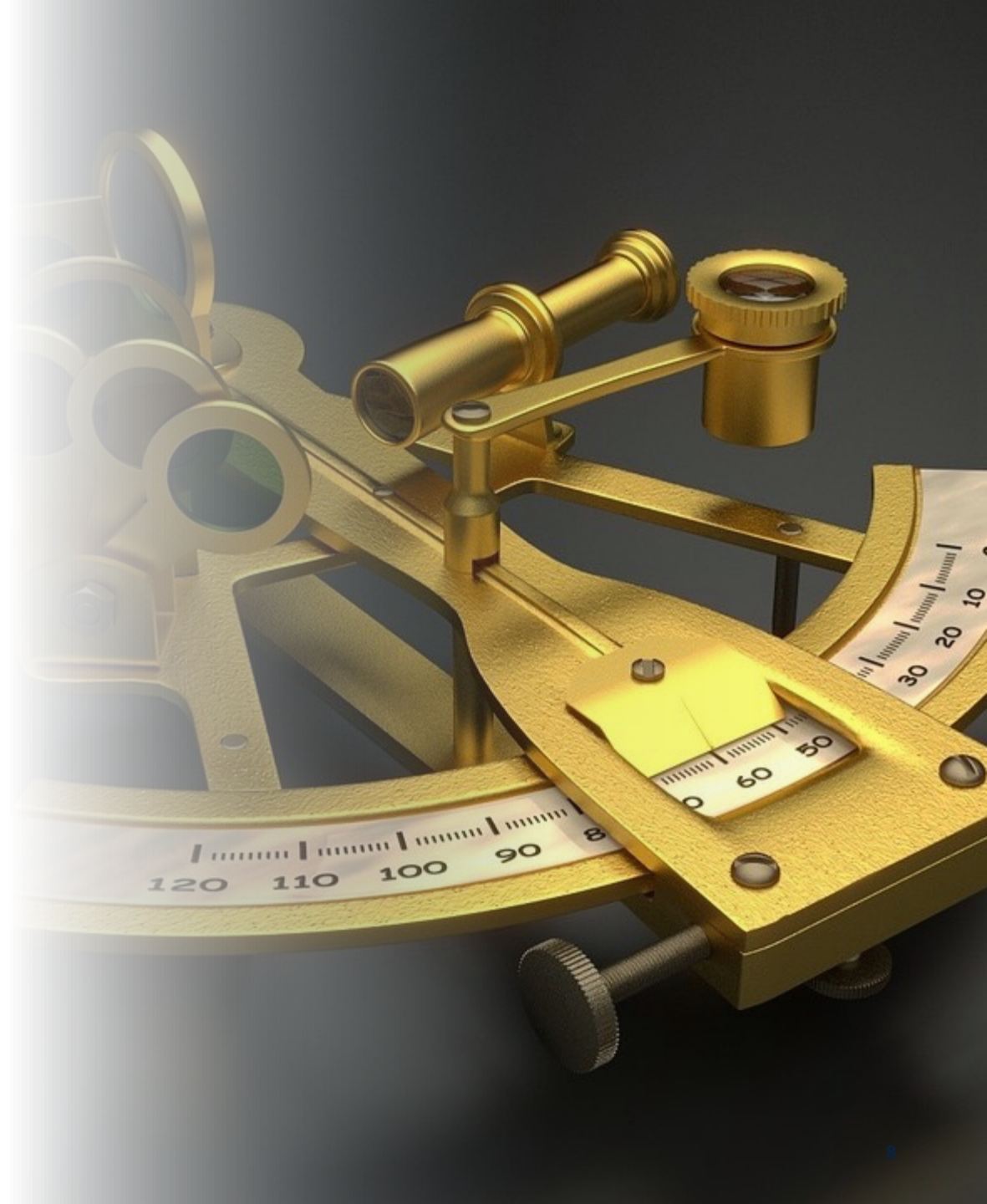
Operators / Manual operations
– risk of making errors ...



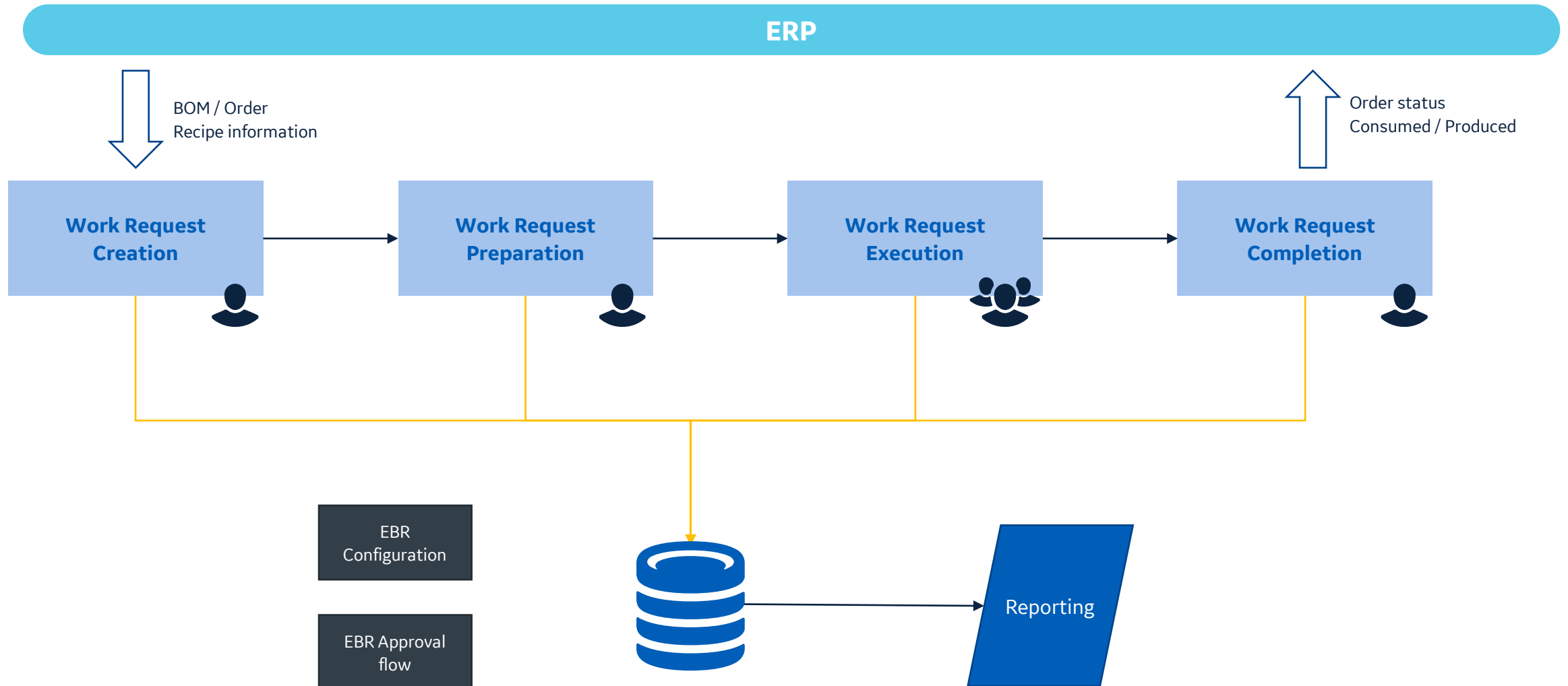
Smart investment – big impact Digitization of Work Processes (based on a true story)

Company Challenges

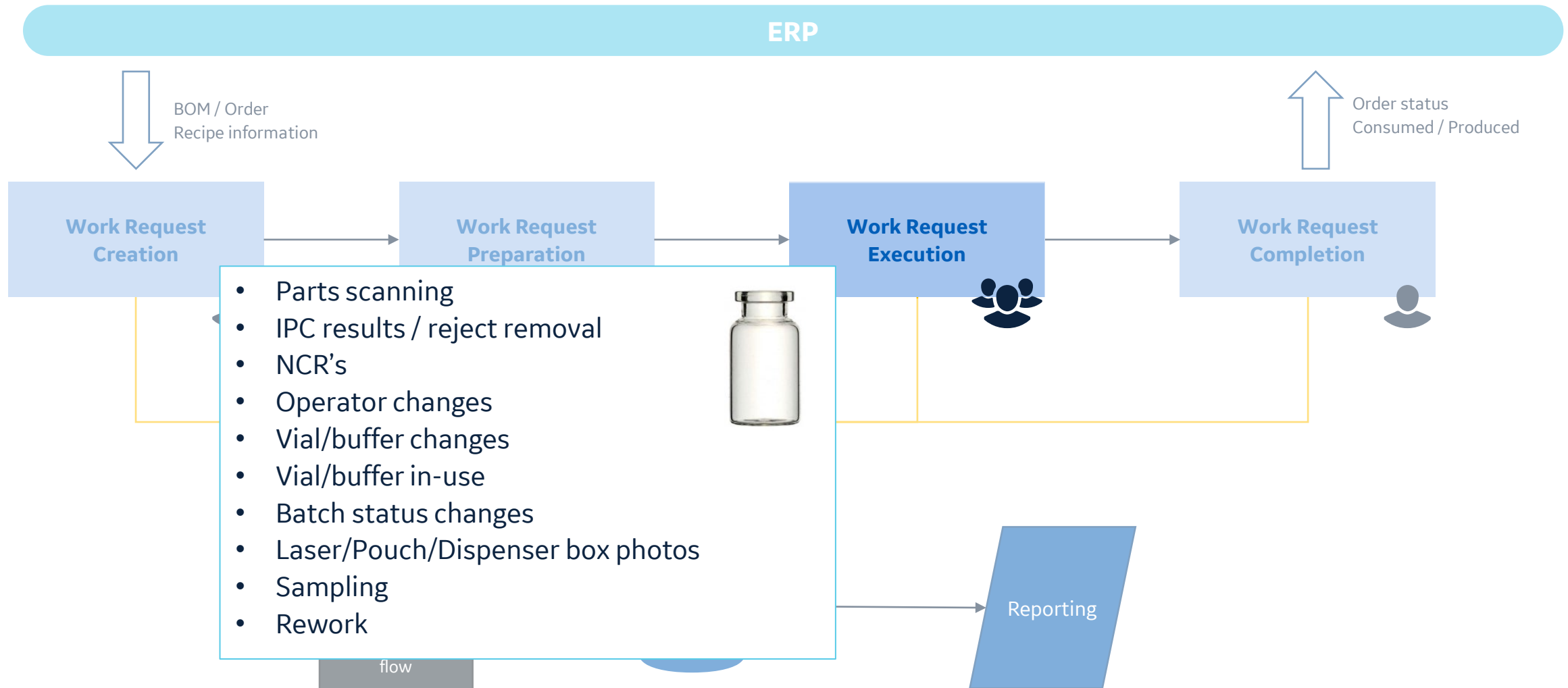
- Validation - Compliant with FDA & GMP
- Clean room environment
- Operators don't follow the procedures
- Operators getting used to the system
- Need new insights for improvement
- Huge amount of data



Production Execution



Production Execution & the Master Batch Record



High Level Concept

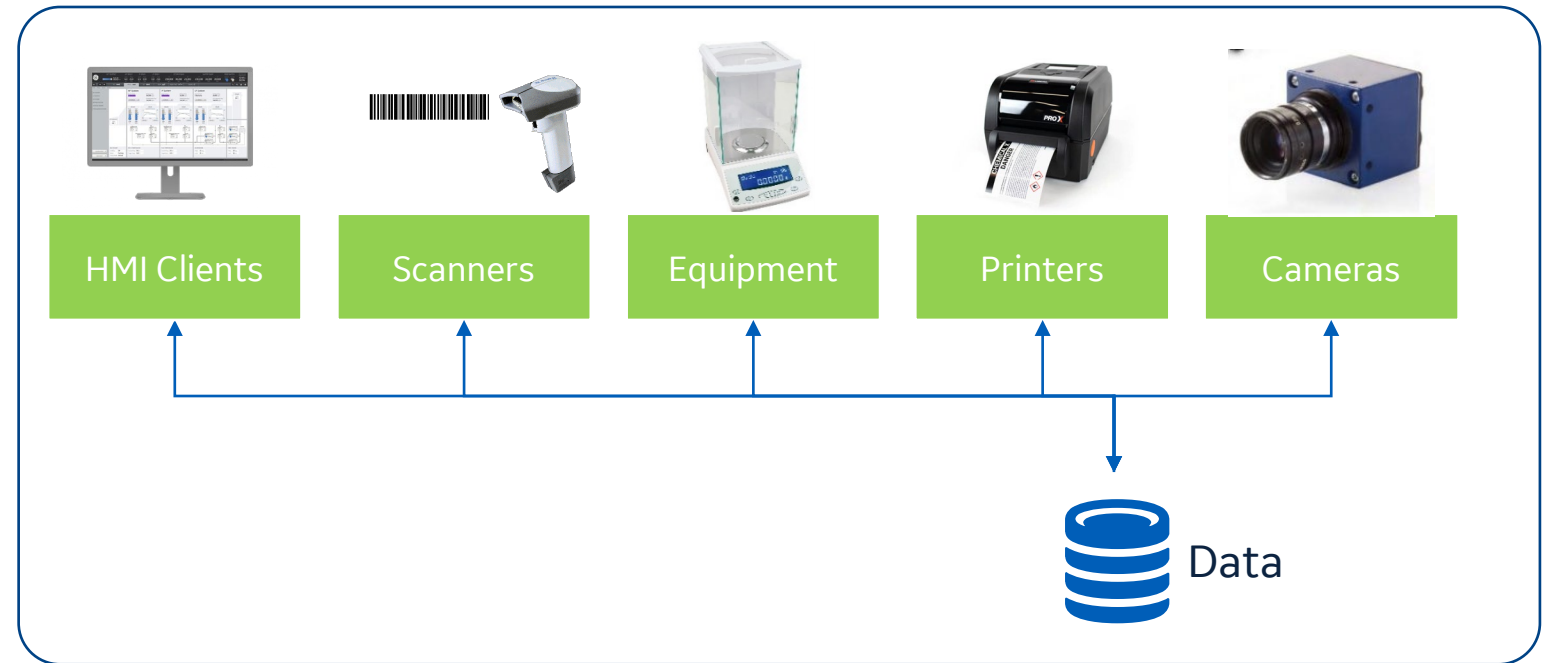


Digitization of all work procedures

- Workflows / SOPs
- Manual activities
- All operator inputs

Master data

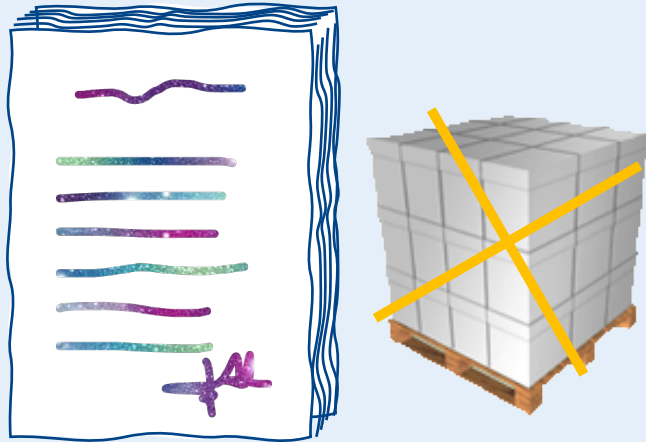
- Workplaces
- Materials
- Work instructions
- Orders
- Users / roles
- Etc.



Benefits of digitization



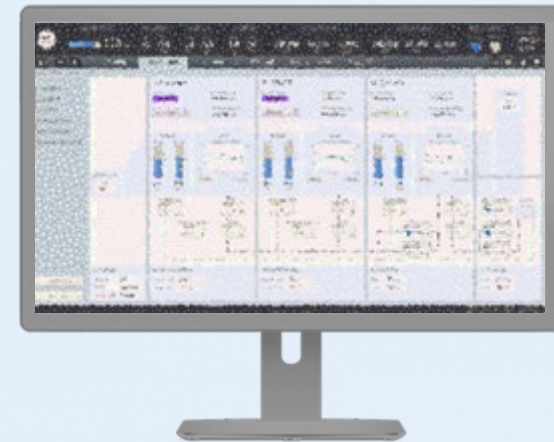
BEFORE



80-page batch report on paper
Up to 2 days to review

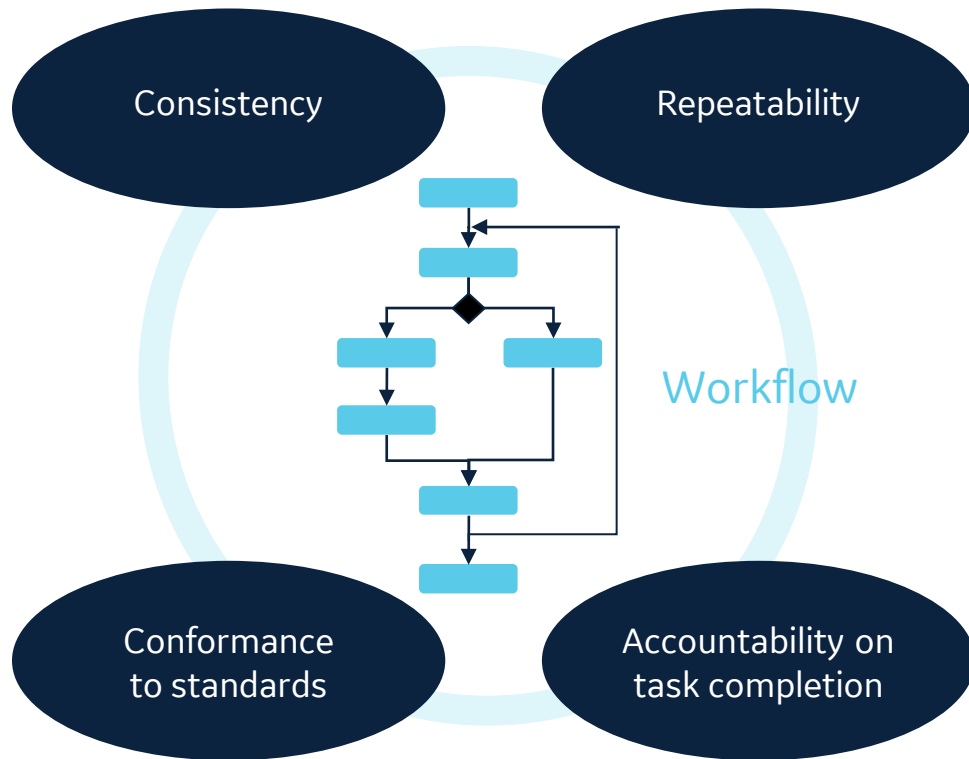


AFTER



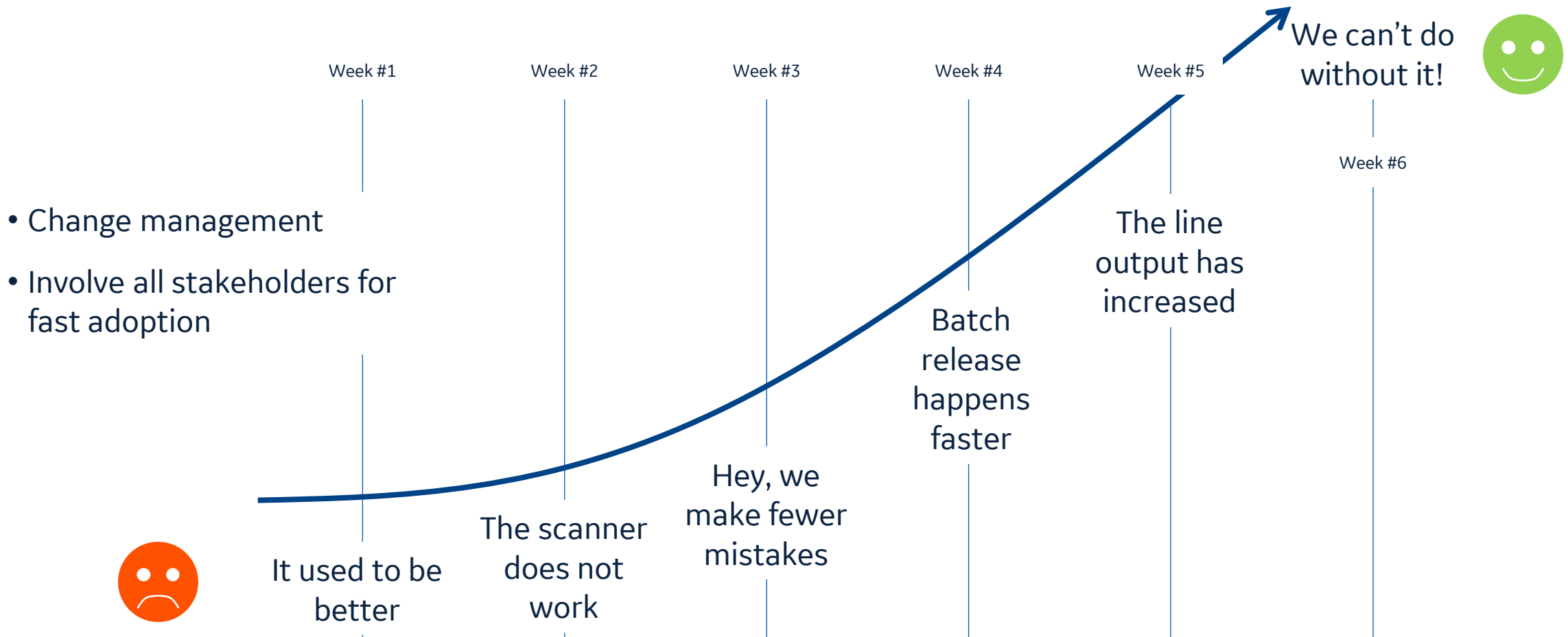
No paper - all digital
Review by exception in less than 20 min

Digital Work Process Management High Level Benefits and applications



- Operator task management
- Alarm & Event response management, plus corrective action
- Digitize best practices, SOPs and work instructions
- Orchestrate work processes & backend data
- Manage specification changes
- Manual assembly error proofing
- Security procedures
- Batch processes
- Line, work cell, and machine setup
- Decision wizards
- HACCP monitoring procedures and corrective action
- Digitized Good Manufacturing Practices (GMP)

The adoption curve



Results

- Centralized Information – a single source of truth
- User guidance – less errors
- Enhanced data integrity
- No more data silos
ERP, MES, SCADA, equipment, printers, scanners, etc.
- Shorter review / approval flow: RBE
- Elimination of **tons** of paper
- NEXT: more reporting & analysis possibilities





MES* to increase overall plant productivity

* MES: Manufacturing Execution System

Motivating factors



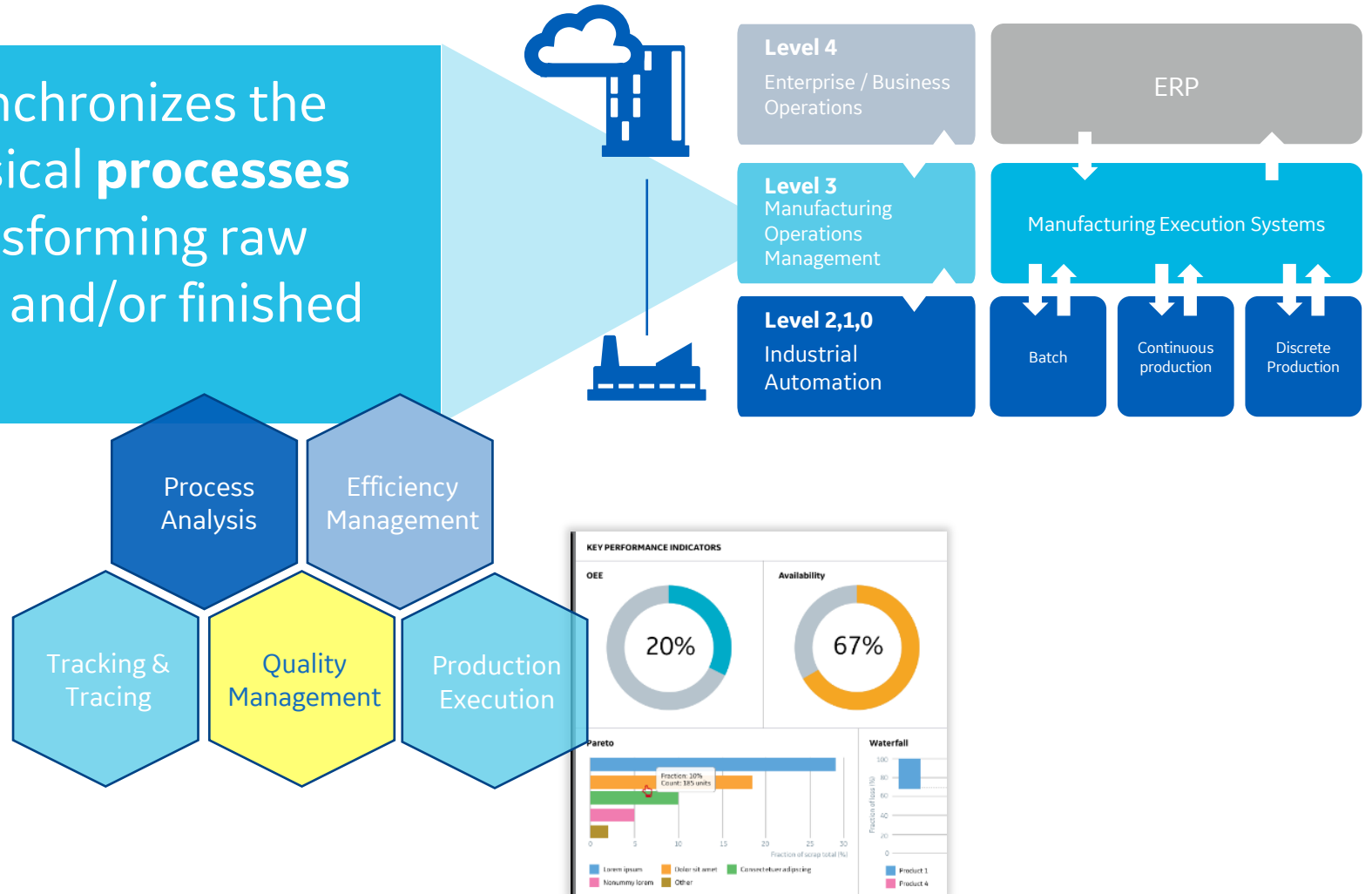
- Lack of real time control – difficult to react quickly to stops & changes in production.
- Increase the overall productivity to match demand:
 - Increase production efficiency of production lines
 - Minimizing the downtime
 - Increasing product quality – reduce variability
 - Minimizing the number of shortages.
- Many different lines & machines - difficulty to access root cause of equipment failures & deviations
- Better manage manual operations
- Improve data quality to improve KPIs &
 - A single source of truth
 - Accessible & trusted data



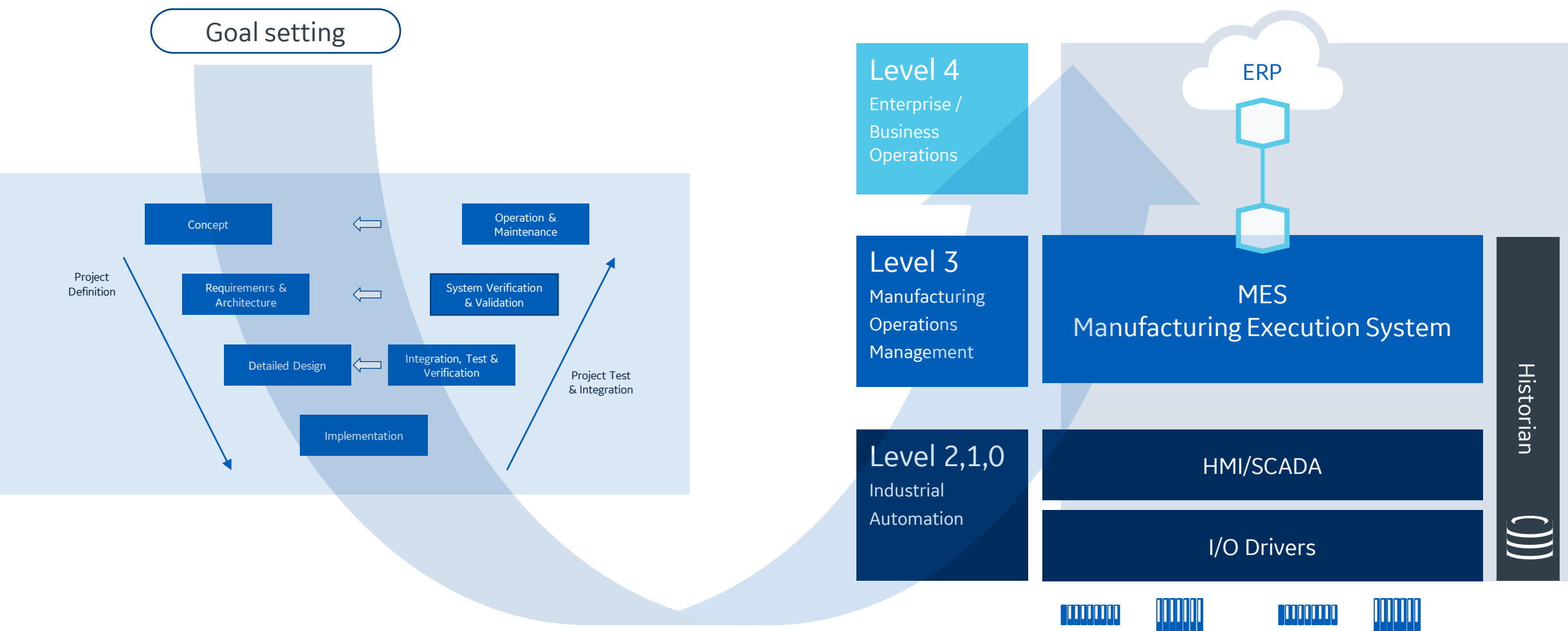
MES (Manufacturing Execution System) at a glance



“Manages, monitors and synchronizes the execution of real-time, physical **processes** and **people** involved in transforming raw materials into intermediate and/or finished **goods**.”



Top-down design & bottom-up implementation



Results

A unified Manufacturing Operations Management system for scheduling, monitoring & management of process modes

Analysis of downtime & other deviations

Culture change - production personnel:

- More “responsible attitude” of the plant's operators & technical services
- Leads to increased efficient & faster management decisions

A new level of flexibility and ability to respond to change

- Remote monitoring & control, rapid reconfiguration of lines to new products, effective management of all KPIs, etc.)
- Short learning curve for new/existing plant personnel.



20% Increase in OEE

70% Decrease in productivity losses

80% Decrease in downtime

New perspectives

Development plans:

- Use accumulated experience & new knowledge opens up a wide range of possibilities
- Scale the solutions across other sections of the plant
- Unification software solutions at the level of all production management.



20% Increase in OEE

70% Decrease in
productivity losses

80% Decrease in
downtime



Increase visibility thru a collaborative hub

Better connect & use data sets across your manufacturing network to improve visibility and performance?



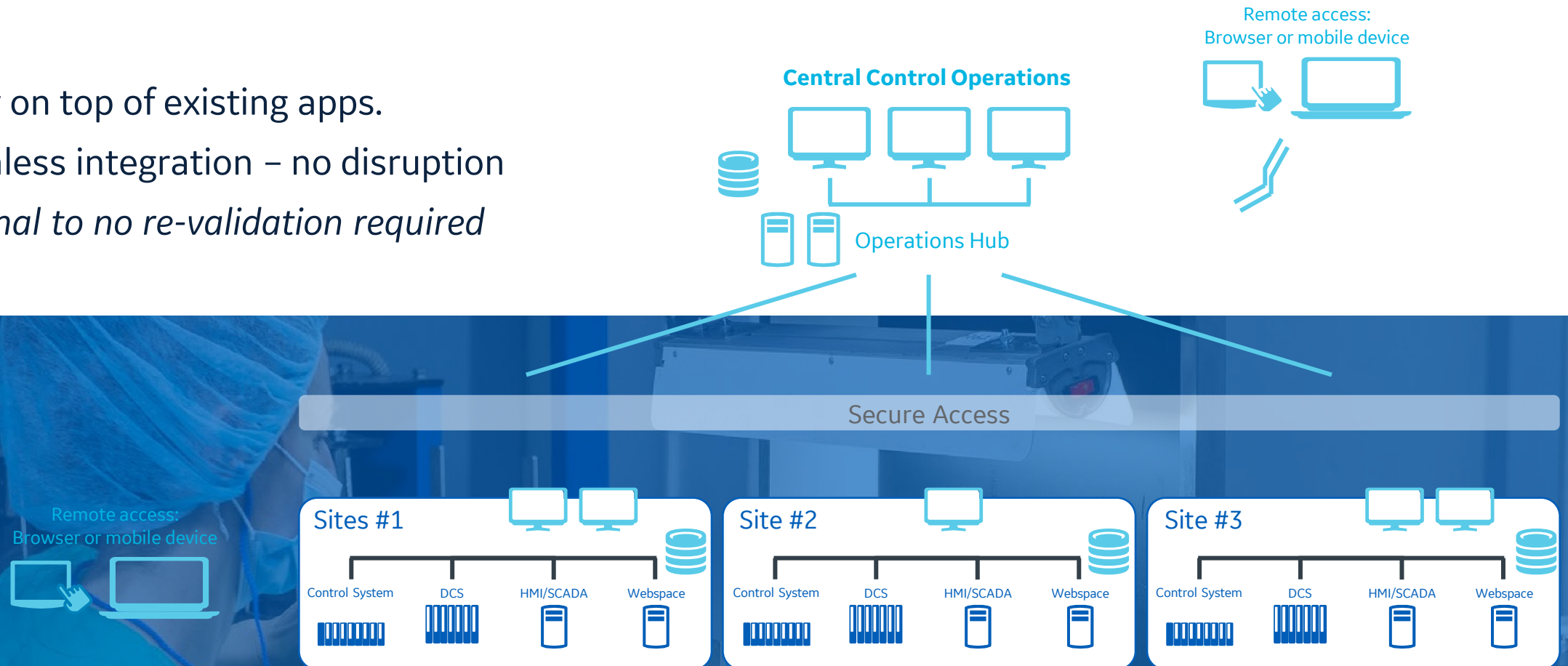
- Layer on top of existing apps.
- Seamless integration – no disruption
- *Minimal to no re-validation required*
- Cross plant
- Enterprise-wide



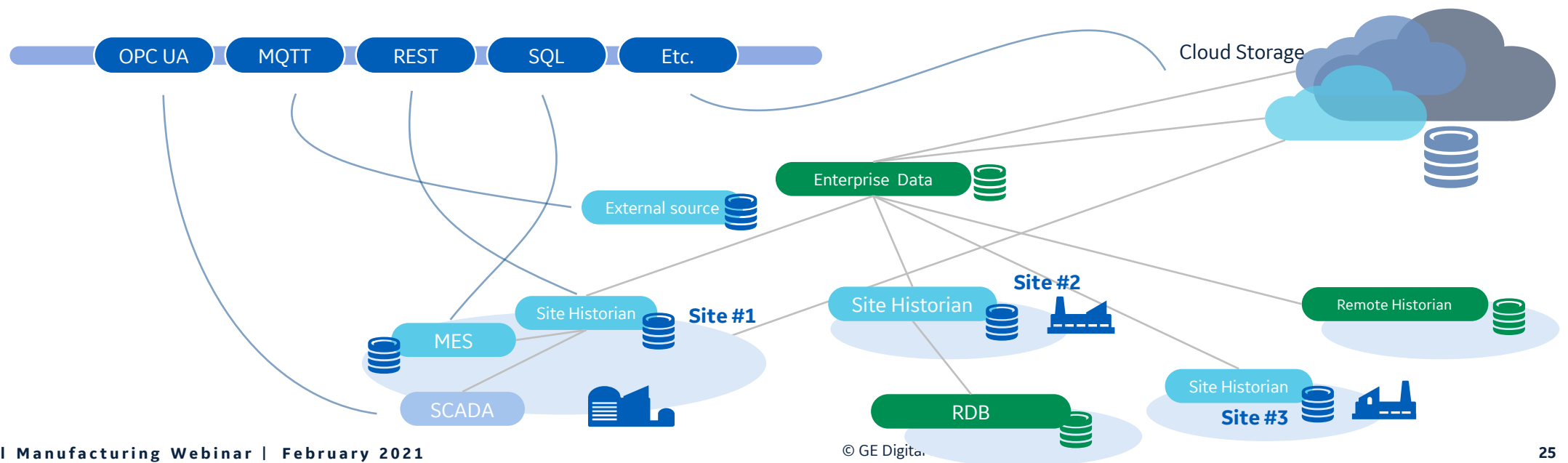
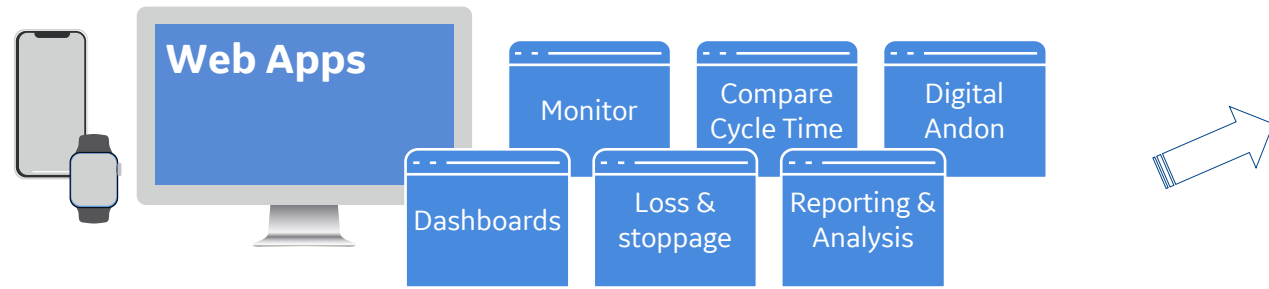
Enterprise-wide visibility



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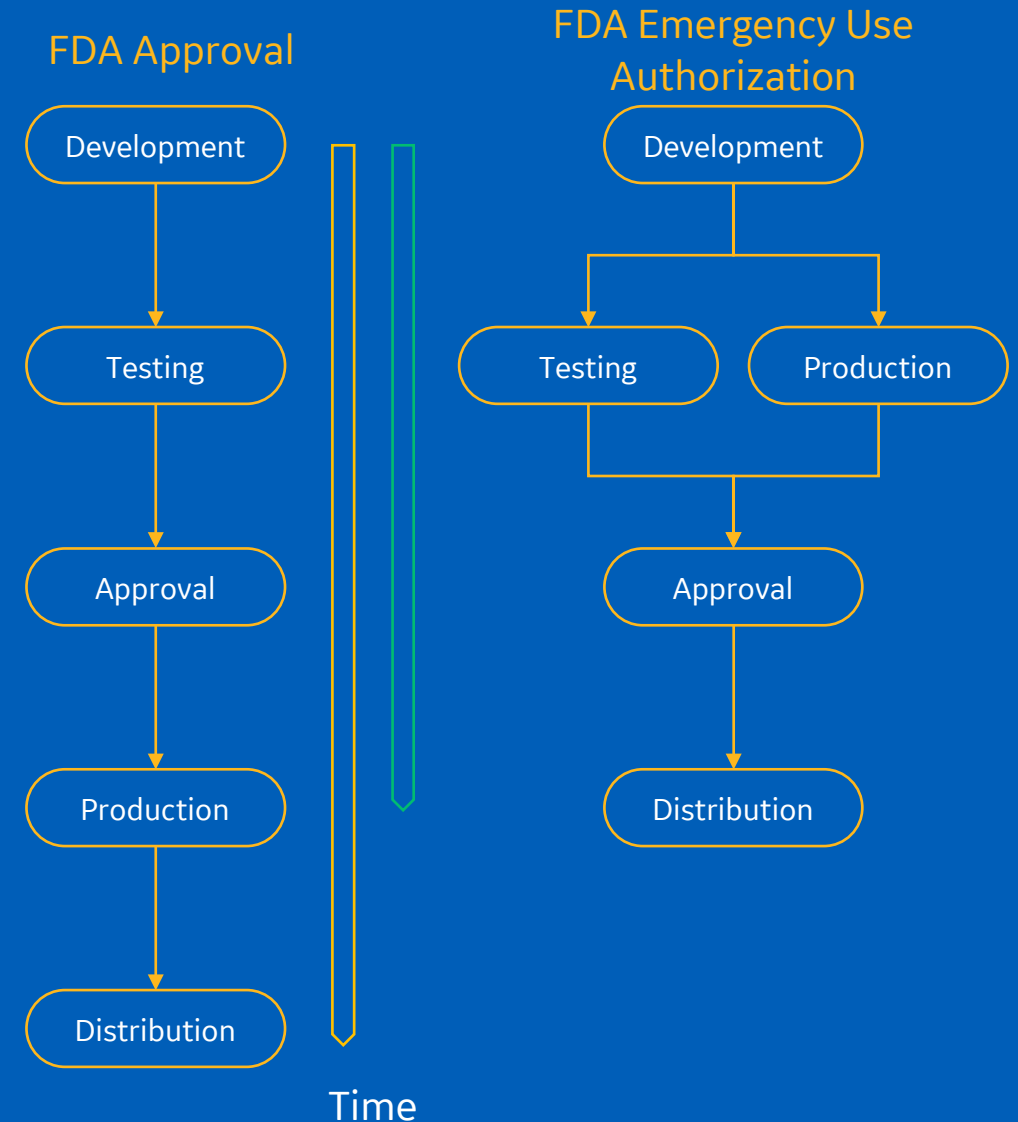
Consolidating data from heterogeneous sources for Visualization



Short time to value for Pharmaceutical users

ENABLERS

- RAD (Rapid Application Development) – configurable vs. programmable
- Object orientation
- Incremental development – continuous improvement



An Operations Hub for continuous improvement



1

See all data in
context – visibility &
scalability

2

**Democratize digital
tools** for greater
accessibility

3

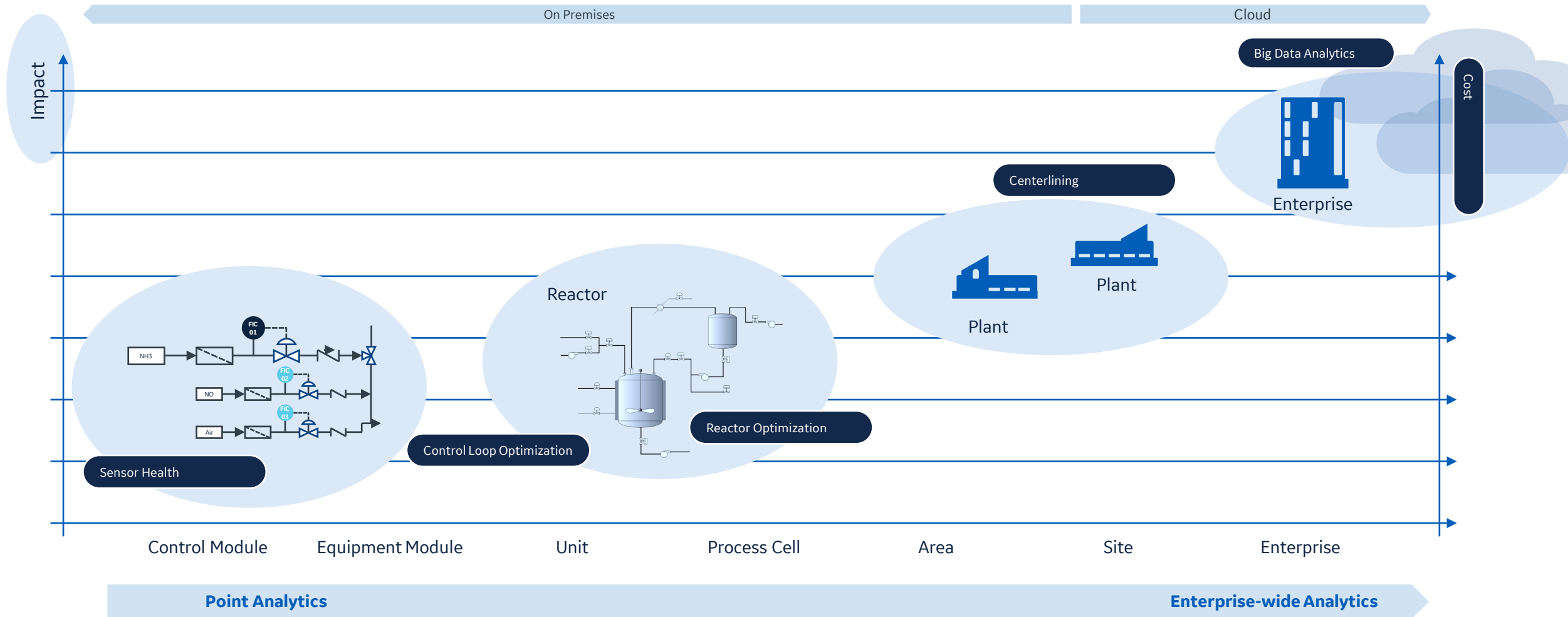
Leverage analytics
for assistance, advanced
warnings & intelligent
decision making





Analytics for increased insights & value

Analytics – from plant floor to cloud

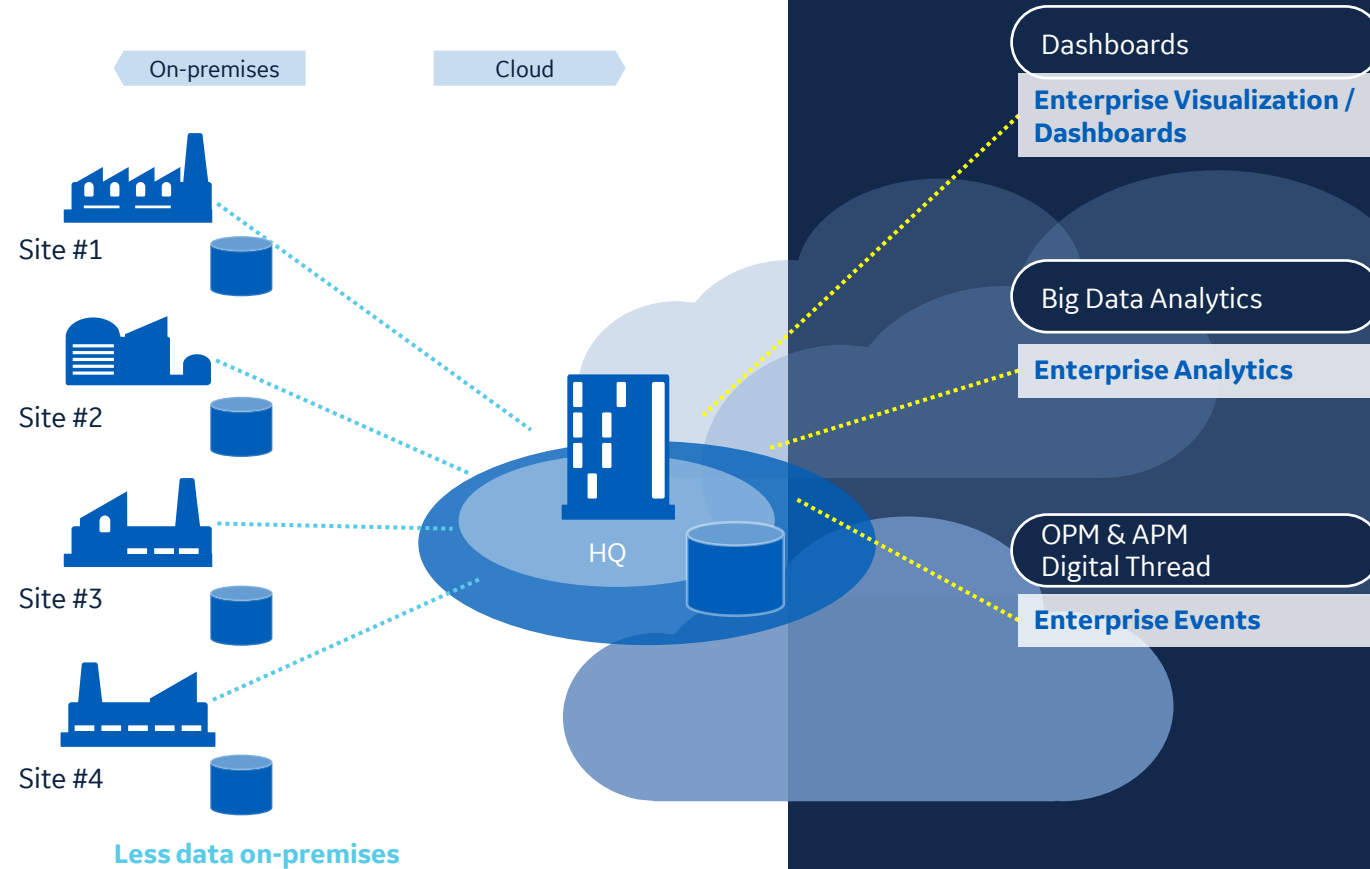


Hybrid cloud strategy

Enterprise-wide visibility & analytics

What data & where to keep it – based on criteria like:

- Regulatory control
- Critical to operations
- Not required – long-term
- etc.

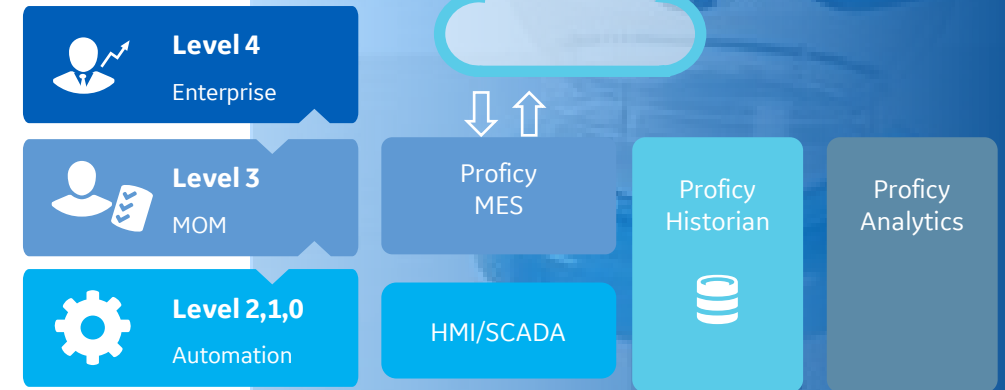


Aggregate data for increased insights & turn it into **value**

- Consolidate and transform manufacturing data across plants for **cloud storage, analysis, and analytics.**

OUTCOMES

- Detailed, data-supported view (**centerlining**) into the production processes provides insights that **drive efficiencies up.**
- Better meet data **compliance** regulations
- Reduce storage** size on premises



The right time to boost your Digital Health



Thank you!

Bernard E. Cubizolles,
Global Product Marketing Manager – Digital Plant
GE Digital

