



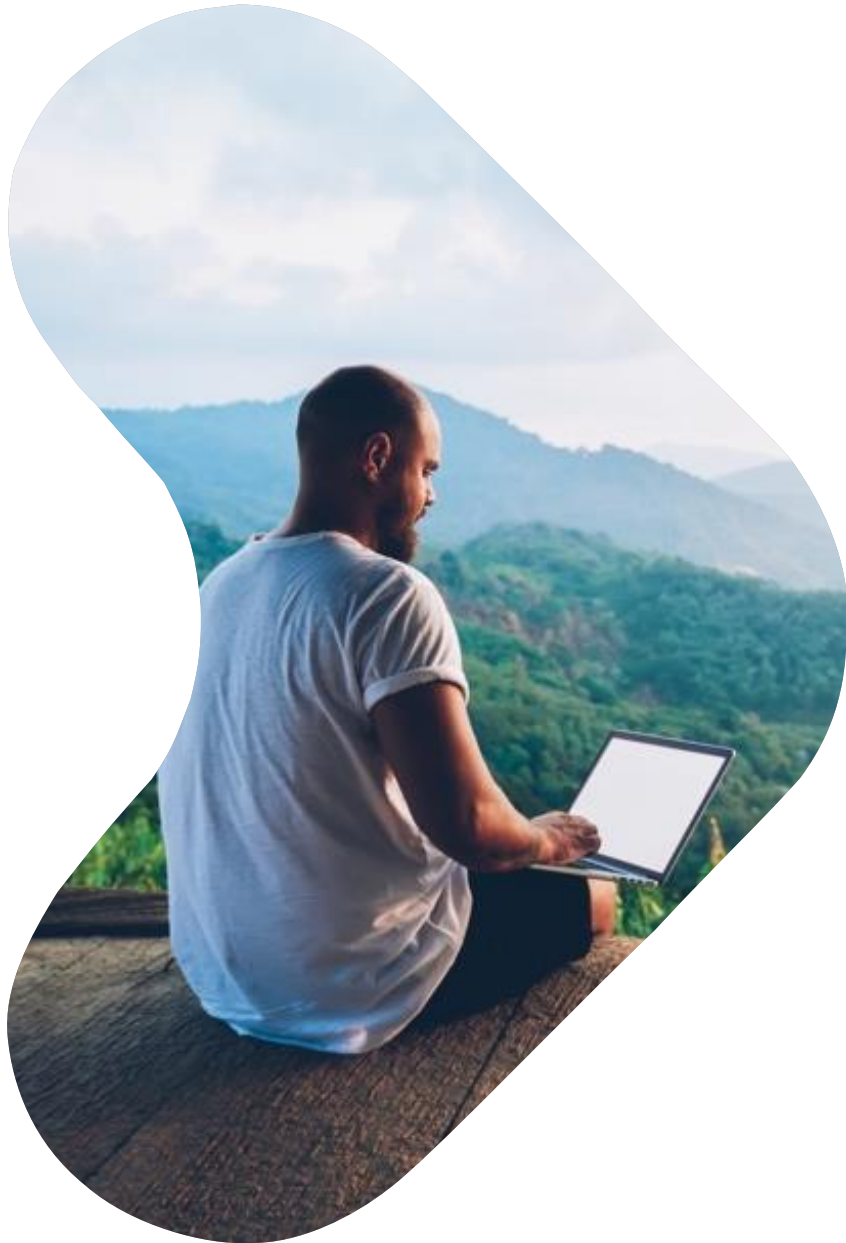
STL Digital Drive

Insights Driven on PI System



Contents

- **STL- Data Network Innovators**
- **PI System @ STL**
- **Challenges - Data is new Oil**
- **Data Collection and processing Architecture at STL Manufacturing Facility**
- **Insights from PI System Dashboards**



1
Core
Business

We are the

Data Networks Innovator

3
Innovation
Engines

We drive innovation through

Connectivity
Solutions

Network
Services

Network
Software

9
Distinguished
Capabilities

backed by our unique capabilities in

- Advanced Photonics
- Materials Science
- Precision Manufacturing
- Algorithmic Design
- Ultra Fast Deployment
- Automation & Robotics
- AI Analytics
- Programmable Networks
- Web scale DevOps

STL in numbers



Customers

- Partnering with
8 of 10 Top Telcos
- Working with
Top 2 Cloud Co.
- Operating in more than
100 countries

People

- **3.1k+ Associates**
- **30+ Nationalities**
- **Great Place to Work
Certified**

Innovation

- **4** Innovation Centres
- **90%** -Y-o-Y patent filing growth in FY19
- **103%** - 5-year CAGR for optical fibre cable patent portfolio growth

Financials

- **\$1.5 billion**
Order Book
- **\$737 million**
in revenue
- **43%**
revenue from exports

Global Footprint

- **7** Global Production Facilities
- **50 million** fkm Fibre Capacity

Environment & Society

- **100%**
Recyclable Packaging Material
- **STL Garv**
Rural-connectivity platform
- **STL Academy**
1.5k certified youth
- **Zero Waste to Landfill**

Innovating for tomorrow's network creators



Telcos

to connect each customer with the latest data applications while ensuring better experience

30x denser networks to connect 1.2 Billion by 2025



Cloud Co.

to enable future applications and immersive content by bringing compute and storage capabilities to the edge

\$66 Billion cumulative annual capex by top three Cloud Co.



Citizen Networks

to empower every citizen with high-quality primary connectivity

City governments, globally investing to "democratize broadband"



Large Enterprises

to create secure networks for the specialized enterprise use cases

Secure networks market to touch \$250 Billion, by 2024

Data is new Oil – Challenges ?

Real-time , Accurate and Touch less

How to improve data quality

Detect Early & eliminate process scrap

How to early detect and eliminate process scrap

Asset Sweating

How to bring visibility of machine downtime data



Big Picture

Horizontal extract for decision making

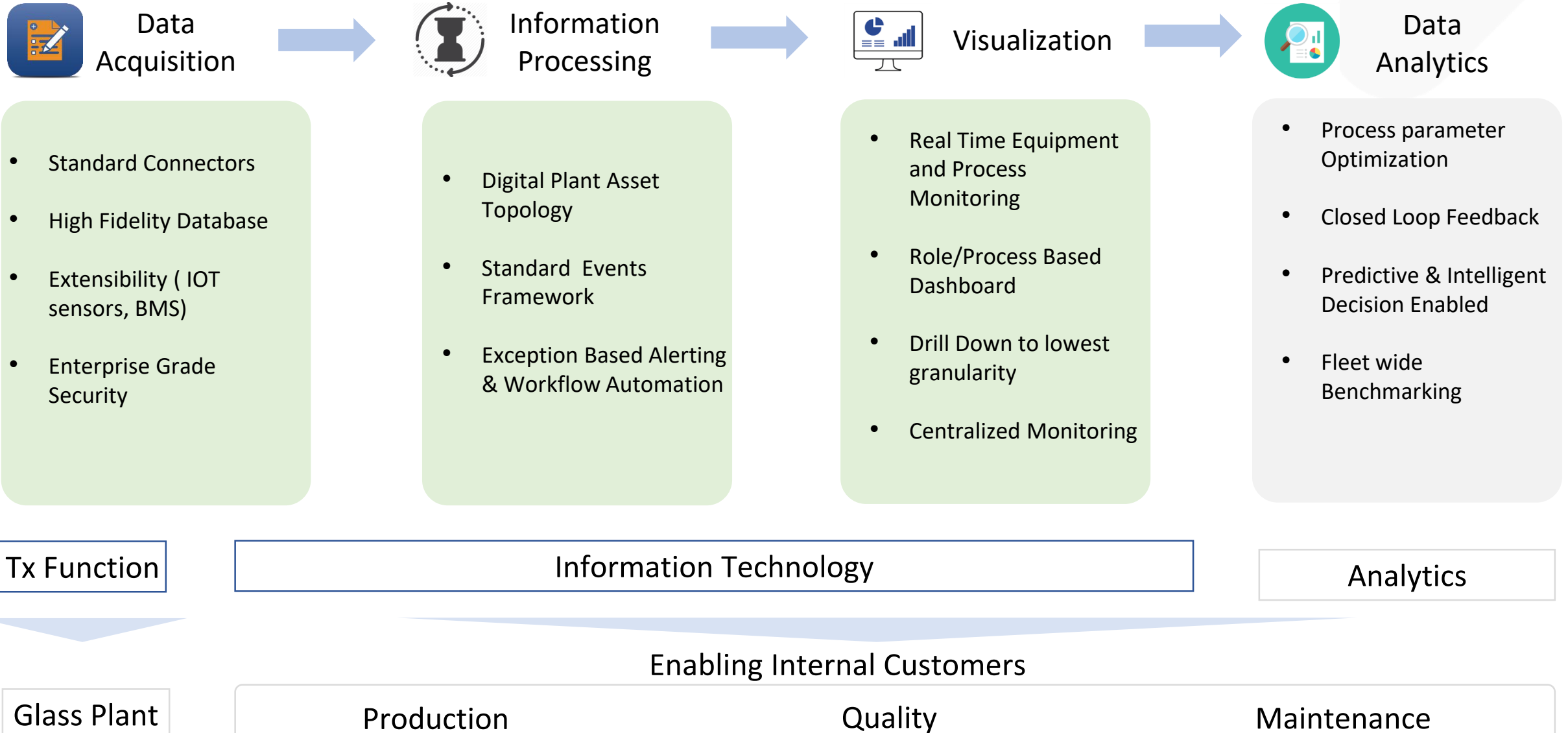
Optimize Inventory

How do we optimize inventory by leveraging real time insights

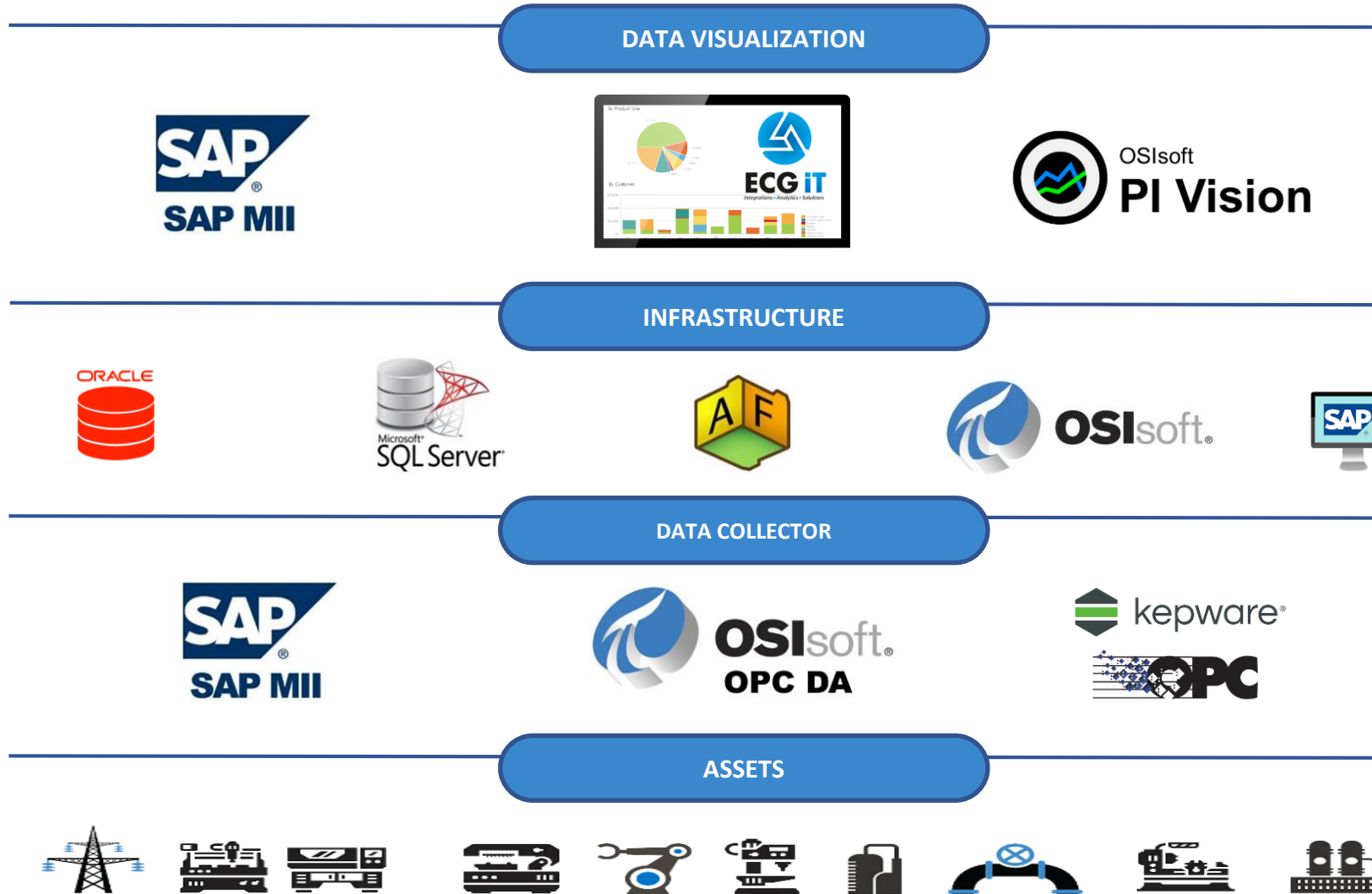
Eliminate Manual Intervention

How to eliminate manual intervention in process corrections

Design Principle for Digital Cockpit



Logical Architecture



PI System Dashboards- Plant Visibility



PLANT OVERVIEW

Downtime Dashboard

AREA

DEPARTMENT-01
M1 M2 M3 M4

DEPARTMENT-02
M1 M2 M3 M4

DEPARTMENT-03
M1 M2 M3 M1 M2 M1 M2 M3

M1

AREA

M1 M1 M2 M1 M1 M2 M3

AREA

M1

M1 M2 M3

AREA

DEPARTMENT-01
M1

DEPARTMENT-02
M1

DEPARTMENT-03
M1

DEPARTMENT-04
M1

DEPARTMENT-04
M1

AREA

DEPARTMENT-01
M1 M2 M3 M4 M5 M6 M7 M8 M9 M10
M11 M12 M13

DEPARTMENT-02
M1 M2 M3 M4 M5 M6 M7 M8 M9 M10
M11 M12 M13 M14 M15

DEPARTMENT-03
M1 M2 M3 M4 M5 M6 M7 M8 M9 M10
M11 M12 M13 M14 M15 M16 M17 M18 M19 M20
M21 M22 M23 M24

DEPARTMENT-04
M1 M2 M3

DEPARTMENT-05
M1 M1

AREA

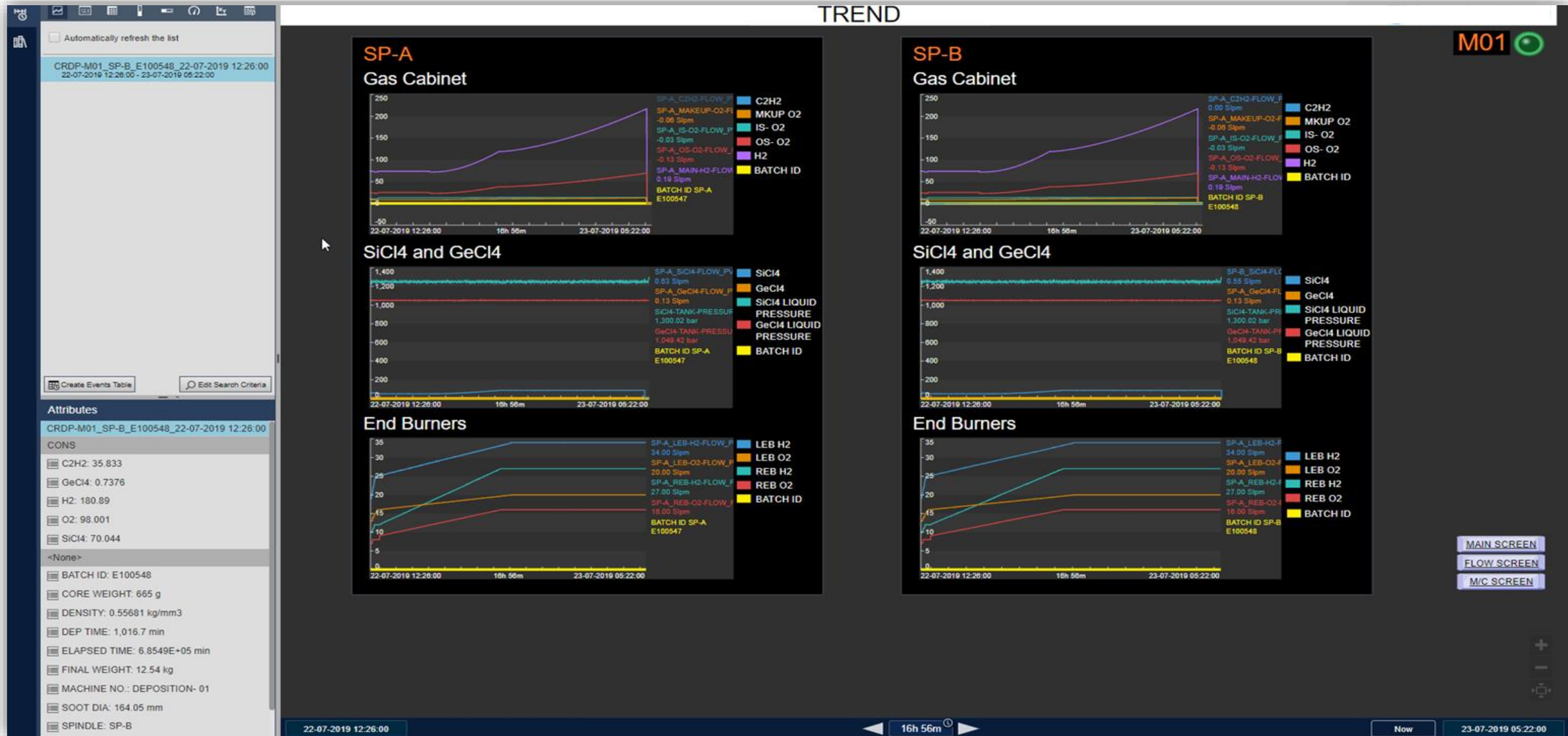
DEPARTMENT-01
M1 M2

DEPARTMENT-02
M1 M2 M3 A

DEPARTMENT-03
M1 M2

LEGEND ■ RUNNING CONDITION ■ IDLE CONDITION ■ MACHINE NOT CONNECTED ■ BAD VALUES M MACHINE IPQ IN PROCESS QUALITY RIC ROD IN CYLINDER
PDMS PREFORM DEFECT MEASUREMENT SYSTEM SMS SOOT MEASUREMENT SYSTEM GWL GLASS WORKING LATHE A ALARM

Batch traceability Using Event Frames



Key Benefits



FUNCTIONALITY

Real Time Capturing of
Process Data

Machine Wise
Production Planning

Complete Traceability

Multivariate Product
Parameters Analysis



BENEFIT

Low Touch Manufacturing
Improved Predictability of Process Failure

Product Cost Optimization
Real Time BOM Variance

Improved Quality & Productivity

Predictable Product Quality

Key Benefits..



FUNCTIONALITY

Inventory classification
based on process types

Preventive Maintenance
Planning

Application/ Data Security



BENEFIT

Inventory Visibility Product Wise

Improved uptime of Machines
Reduced rejections due to machine malfunction

100% Elimination of Sabotage cases

What were the outcomes/results?

+90%

Machine Data
Automation

0%

Material Data
Reconciliation

~ 15%

Improvement in
planned maintenance
adherence

100 %

Elimination of Sabotage
Cases

100%

Real Time
Dashboards



beyond tomorrow