




SMART MANUFACTURING:

**AI technology to increase
manufacturing capacity
without adding workforce
or production equipment**



In this e-book: Smart Manufacturing: Learn how to leverage AI technology to increase capacity with existing facilities and resources.

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Lack of machines parts limiting capacity & chip availability, components and raw materials

Supply chain capacity is being stretched by the pandemic at all points, starting with component suppliers. The global supply chain continues to be disrupted at every step. Unfortunately, the economy does not appear to be recovering anytime soon.

A lack of key manufacturing tools has prevented capacity levels from being expanded to meet increased demand.

A few segments in particular are fueling current spikes in chip demand: the Internet of Things (IoT), 5G, smartphones, and especially the automotive industry.

In addition to chip shortages, we are experiencing unprecedented lead times from analog suppliers and price increases. Due to equipment shortages, factory capacity is expected to be limited until at least 2024.



When it comes to increasing manufacturing capacity, there are challenges:

- **Inefficiency** in manufacturing
- **Bad design** for manufacturability
- **Lack of Control** of vendors quality
- **Continual delays** caused by **downtime**

Increasing worldwide production capacity with existing facilities and resources

It is possible to produce more with existing facilities and resources.

Increasing production capacity is the main focus of many manufacturing companies in today's reality. It is possible to leverage AI technology and smart manufacturing to produce more with existing facilities and resources.

Smart manufacturing can boost capacity and efficiency within limited availability of human and machine resources by empowering data. Using an end-to-end control solution will improve production efficiency and allow capacity expansion by having all areas of the factory areas integrated and well monitored. The following features of an AI analytics will have direct impact on increasing capacity for manufacturing:



QualityLine's AI analytics and automated data integration maximize manufacturing efficiency and product quality by continuously collecting all manufacturing data into a unified digital twin database. Data sources from multiple global locations are harmonized and analyzed in real time

The main challenge:

A lack of control over the manufacturing process

Endless types of data formats and structures from different locations, types of machines and equipment.



Artificial intelligence can help solve the following problems:

- Data integration and unification from every source and location
- Low quality of products
- High cost of manufacturing
- Inefficiency in manufacturing
- Bad design for manufacturability
- Assets performance & connectivity.

In order to increase capacity, AI data analysis can provide the following benefits:

- Predictive technology
- Predictive Maintenance and OEE
- Correlate product quality in the market to the manufacturing process and product design

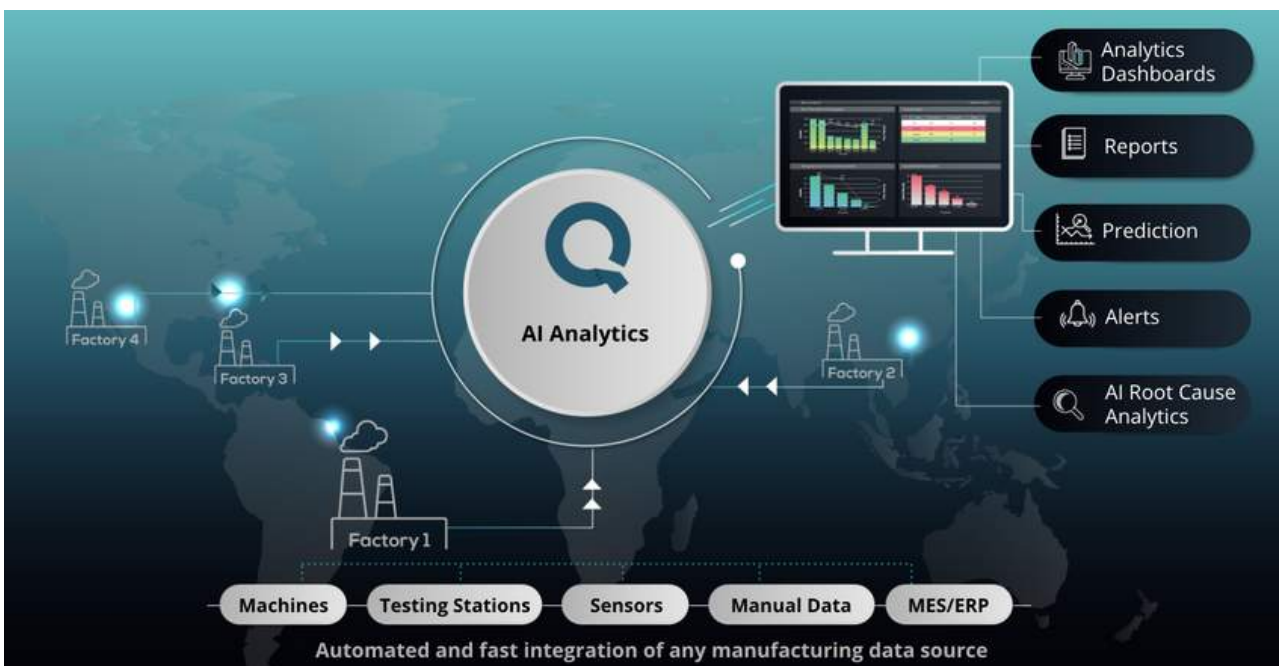


Global end-to-end control

QualityLine's AI manufacturing Analytics and automated data integration integrates any type of manufacturing data sources from multiple global locations. The data is harmonized and analyzed in real time to provide **End-to-End control** over the entire manufacturing process. With the solution, manufacturing efficiency is maximized, resulting in a **rapid increase in capacity**.

The AI Data Pattern recognition technology scans the data samples of every data source and structure related to a production process and a product:

- Testing data
- Repair data
- Machine data
- Manually & automatically collected data
- Sensor data etc.



The AI technology understands the content, hierarchy, and source of the data, mapping it and interpreting to create a digital database containing all production, process, and product data for a production network.

*Any new information created within the production network is automatically understood by QualityLine's AI technology using an advanced capture tool that interprets, maps, and writes it into the digital twin database.

Using AI to evaluate your internal processes:

Testing data; manufacturing process and product design

When it comes to optimizing production, both long-term and short-term approaches are applicable. By evaluating all areas in your factory, you will be able to identify what can be improved. Evaluation of performance is based with an emphasis on efficiency.

With analytics integrated into all production machines, you will be able to monitor their operation in real time. You will be notified automatically if your production is experiencing downtime.

By having fast access to data, you can troubleshoot quickly and choose the right next action to better overcome manufacturing challenges. With less downtime frequency for example, you can optimize your output capacity.

As all false testing activities (manual and automated) as well as repairs of faulty units are closely monitored by QualityLine, the overall average standard time to produce a unit will be reduced.

In addition to identifying unnecessarily repeated tests, QualityLine also identifies the coefficients of correlation between tests. By identifying and preventing inefficient or faulty activities, manufacturing teams can avoid downtime.

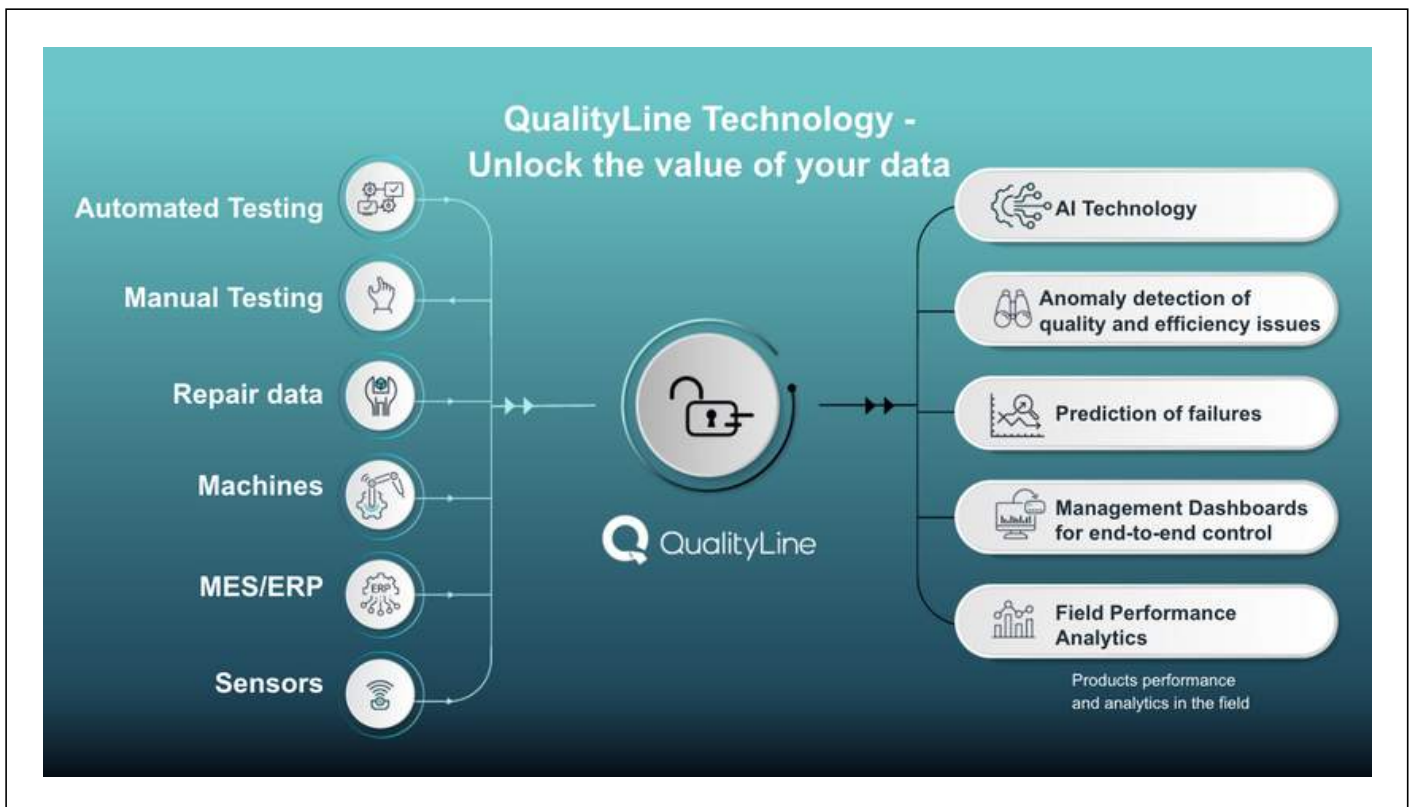
Correlate product quality in the market to the manufacturing process and product design

QualityLine's AI analytics automatically identify the root causes of your process problems through AI correlations of problems found at machines to reduce downtime.



Identifying inefficiency leakages at the production

QualityLine's AI manufacturing Analytics and automated data integration maximizes manufacturing efficiency and product quality as it continuously collects the entire manufacturing data into a unified digital twin database. Data sources from multiple global locations are analyzed in real time.



In order to improve manufacturing process inefficiencies, QualityLine AI analytics predict failures and recommend the right actions.

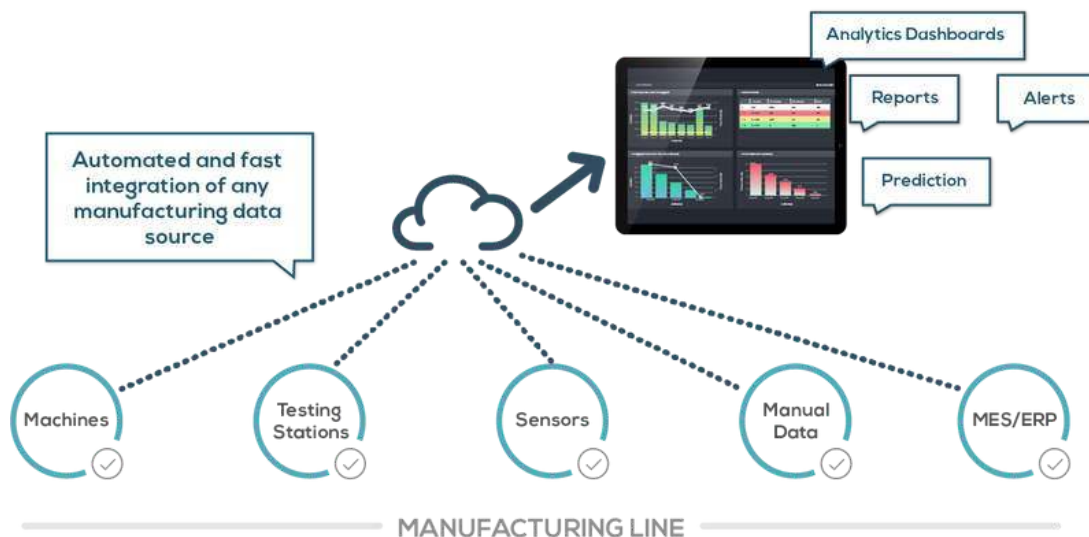
Customers of QualityLine use **Automated Root Cause Analysis** to effectively overcome quality and yield challenges, thereby increasing their productivity and KPI's.

QualityLine AI technology delivers automated root cause analysis:

- Anomaly detection of quality and yield problems.
- Prediction of failures.
- Automatic alerts.
- Smart correlation between stages and parameters for quick problem solving and prevention.
- Monitor vendors and subcontractor's quality of products.

Improving efficiency and capacity: Predictive technology

- Raw factory data is turned into meaningful and actionable information:
- Analyze Test and process data of each single unit and from each process and plant (including from your contract manufacturer).
- Automatically detect Quality and Yield problems.
- Effective Root cause analysis of detected problems
- Automatic alerts are set up
- Prediction of problems is provided
- Key Performance indicators are constantly being constantly measured.






Predictive Maintenance and OEE: Preventing machine downtime

Determine the condition of equipment in order to estimate when maintenance should be performed



Tech Specs

Tech Specs

-  Automated integration process with the factory data. **No API is required.**
-  Harmonization and unification the factory data. **No changes at existing data structures are required.**
-  AI technology to analyze the factory data & **Visualize the BI Analytics for the factory.**

Integration (one time)



- 01- Define the required data for collection and usage
- 02- Identify the relevant data in ANY data format
- 03- AI Data mapping
- 04- Automatic creation of Data capture tool
- 05- Data capture tool remotely installed in factory

Continuous usage



- 01- Data capture tool automatically collects all types of data and converts to unified format
- 02- Data capture tool automatically encrypts and push data to on premise server or to cloud
- 03- Automatic data Analysis using QualityLine algorithms
- 04- Data automatically visualized in interactive analytics dashboards

*Security



QualityLine is certified for ISO-27001 (data security)



The digital twin unified data based can also be installed in the customer's cloud.

CONTACT QUALITYLINE



In case you have any questions regarding how to use AI analytics for quality and efficiency improvement or to simulate your ROI please contact us at: info@quality-line.com

