

PILLS OF KNOWLEDGE

5

Steps to
optimize
production
with data
analytics

Introduction

Industry 4.0 is transforming the industrial sector at a rapid pace. The digitalization of processes, the integration of disruptive technologies such as the Internet of Things (IoT), artificial intelligence (AI) and Big Data, are creating a new scenario where data analytics becomes a crucial element for success.

In this context, production optimisation becomes a pressing necessity for companies seeking to compete in an increasingly demanding global market. Data analytics emerges as a powerful tool that allows information to be converted into knowledge and strategic decisions to be made to achieve efficiency, profitability and quality objectives.

This ebook will guide you through the 5 essential steps to optimize production with data analytics.

1. Definition of objectives

The first step is to establish a clear and precise vision of the objectives to be achieved with production optimization. Are you looking to increase production? Reduce costs? Improve product quality? Reduce machine downtime?

Setting SMART Goals

Specific: They should be clear, concise, and specific.

Measurable: These must be quantifiable in order to assess progress.

Achievable: They must be realistic and within the company's means.

Relevant: They must be aligned with the company's overall strategy.

Temporary: They must have a defined period of time for compliance.

Example:

A company that manufactures electronic components may aim to increase production by 10% in the next quarter. To do this, the company could use data analytics to identify bottlenecks in the production process and take steps to eliminate them.

2. Data Collection

Once the objectives have been defined, the next step is to collect the relevant data that will allow you to analyze the current situation and make informed decisions. This data can come from a variety of sources.

2.1. Sensors and measuring devices

These devices collect real-time data on the status of machines, production processes, and product quality.

Examples: Sensors for temperature, pressure, vibration, speed, humidity, etc.

Advantages: They allow continuous monitoring of production and early detection of potential problems.

2.2. Production Management Systems (MES)

These systems store information about orders, production planning, inventory, and costs.

Examples: MRP, ERP, SCADA, etc.

Advantages: They offer a holistic view of production and allow you to identify areas for improvement.

2.3. Historical data

Historical production data can be a valuable source of information to identify trends and patterns.

Examples: Production data, quality, costs, maintenance, etc.

Advantages: They allow you to perform comparative analyses and learn from past experiences.

3. Data Analysis

The next step is to analyze the collected data for actionable and actionable insights. Various analysis techniques can be used, such as:

3.1. Statistical analysis

It allows you to identify trends, patterns, and correlations in your data.

Examples: Mean, median, mode, standard deviation, regression analysis, etc.

Advantages: It allows quantitative analysis to be performed and reliable results to be obtained.

3.2. Machine learning

It allows you to create predictive models that can be used to anticipate problems and optimize performance.

Examples: Classification, regression, clustering, anomaly detection, etc.

Advantages: It allows you to automate analysis and make more accurate decisions.

3.3. Data visualization

It allows information to be presented in a clear and understandable way for users.

Examples: Dashboards, reports, graphs, diagrams, heat maps, etc.

Advantages: It makes it easier to understand data and make decisions.

Data Visualization Tools

RTM Pro: A suite of tools to discover the root cause of problems. RTM Pro is “in data base” software analytics platform specifically developed for problem solving in the manufacturing environment.

For more information, visit applieditweb.com/rtm-pro

4. Implementation of actions

The last step is to implement the necessary actions to achieve the set goals. These actions may include:

Modification of production processes: To improve efficiency, quality or safety.

Investment in new technologies: To increase production capacity or reduce costs.

Implementation of training programs: To improve the skills of staff in the use of data analytics.

Examples:

Modification of production processes

Implementation of a predictive maintenance system based on data analysis.

Investment in new technologies

Acquisition of new equipment with greater production capacity and lower energy consumption.

Implementation of training programs

Training of staff in the use of data analysis tools.

5. Monitoring and continuous improvement

It is essential to monitor the results of the actions implemented to assess their impact and make adjustments when necessary. Data analytics is a continuous process of learning and improvement that must be reviewed and updated on a regular basis to ensure its effectiveness.

Recommendations:

Engage the entire organization

The success of data analytics depends on the commitment and participation of all levels of the organization.

Start small

It is advisable to start with small and scalable projects to gain experience and confidence.

Invest in training

It is important to invest in training staff so that they can use data analysis tools effectively.

Monitor results

It is essential to monitor the results of the actions implemented to assess their impact and make adjustments when necessary.

Data analytics is a journey, not a destination. It is a continuous process of learning and improvement that can help companies achieve their goals of efficiency, profitability, and quality.

Data analytics has become a fundamental tool for production optimization in Industry 4.0. Implementing the 5 steps outlined in this ebook can help companies take control of their production and achieve their efficiency, profitability, and quality goals.



AppliediT combines a multidisciplinary team of expert IT engineers, data analysts and software developers to offer services of operational excellence, data engineering and application development for data analytics in the industrial environment.

Our objective is to transform the data generated in the industrial environment by people, processes, machines and information systems (ERP, CMS...) into knowledge to improve decision-making based on data, increase efficiency, save costs and optimize production times.

For more information, visit applieditweb.com