



# Manufacturing 4.0



# GET TO KNOW SISTRADE

SISTRADE – Software Consulting, S.A. is an information systems company with know-how in software development and consulting service for different areas, including industrial companies. SISTRADE main goal is to offer the market the best information systems tools, in order to help its customers to improve their performance in all the critical business processes.

Sistrade® is a web-oriented solution that is ready to settle in the business-to-business world, enhancing and extending the market and promoting electronic trade among companies. By the means of features that ensure adherence to the digital economy through the interconnection with marketplaces, it aims at the conquest of new markets. The application interface is all web-based, it is available from an Internet browser which allows access anywhere in the world, simply using Internet access.

## Technology

All Sistrade® solutions use Microsoft SQL Server support database. It is a relational database which optimises IT environments, providing a safe and reliable platform for data analysis and management. SQL Server delivers fundamental technological advances in terms of information repository for collaborative users and adds value to the organizations.

## Markets

Printing & Packaging Industry  
Labels & Flexible Packaging Industry  
Security Printing Industry  
Metalworking Industry  
Plastic Extrusion Industry  
Publishing Industry  
Wire and Cable Industry  
Baler Twine Industry  
Netwrap Industry  
Beverage Industry  
Service sector  
Commercial sector



**SISTRADE is also certified in the standards NP 4457:2007 and ISO 9001:2015**



**WWW.SISTRADE.COM**

## Key Points



**+ 3000 Users**



**+ 20 Countries**



**4 Continents**



**Industry 4.0**



**Automated Data  
Collection**



**SQL Server**



**Cloud Based**



**Real time  
Monitoring**



**Multi-device**



**Flexible and adaptable**



**+ 15 Languages**

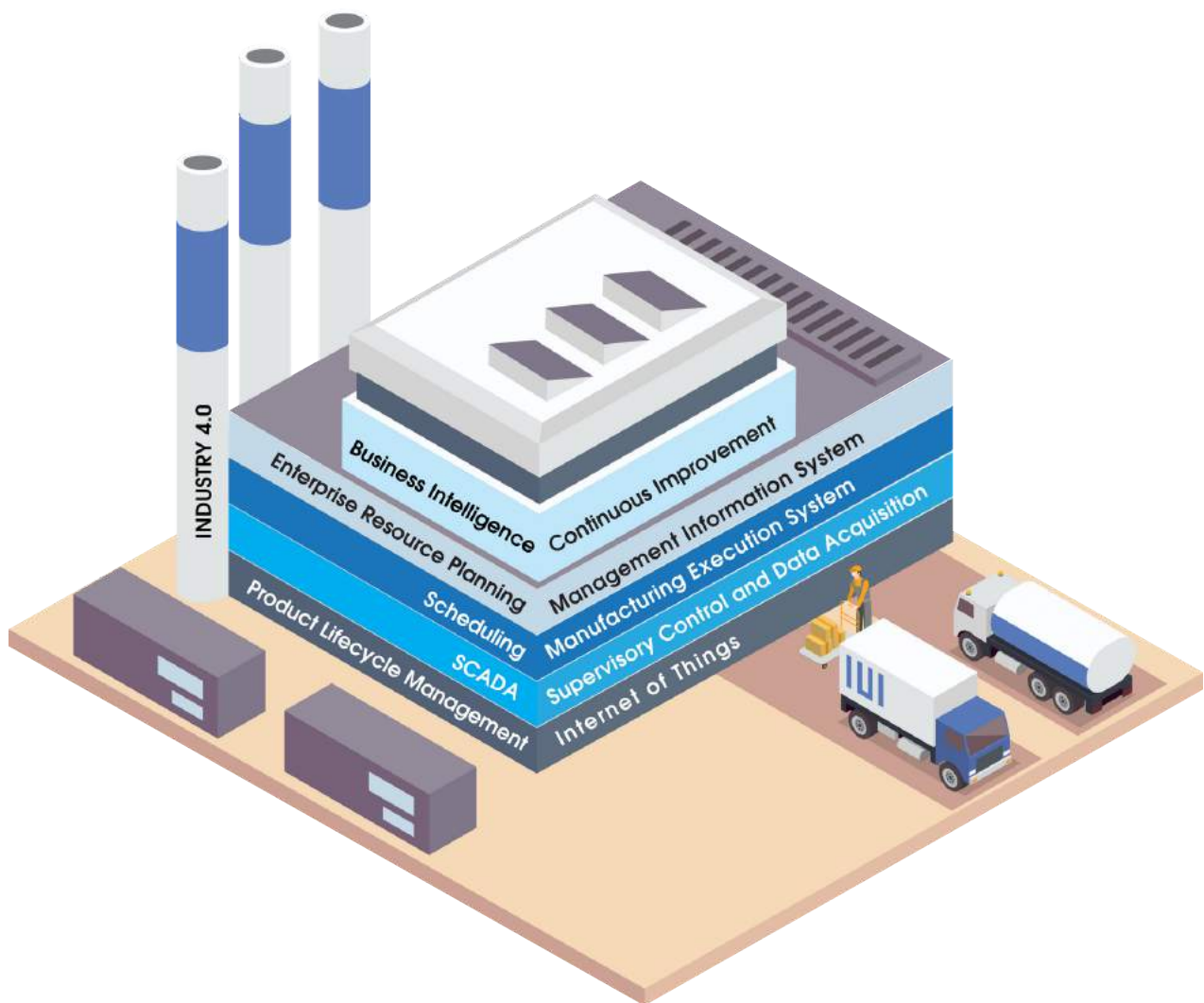


**Business Intelligence**

# Manufacturing 4.0

## Sistrade solution to embrace Industry 4.0

SISTRADE has the right tool to push your company to the Industry 4.0, optimizing, automating, and controlling your production line. One of Sistrade's key applications is Manufacturing Execution System (MES), which delivers solutions to plan, collect data, supervise, and control the industrial process.



**SISTRADE offers solutions allowing to generate appropriate information to quickly support decisions, incrementing productivity, aligned with the foundations of Industry 4.0**

# Manufacturing 4.0

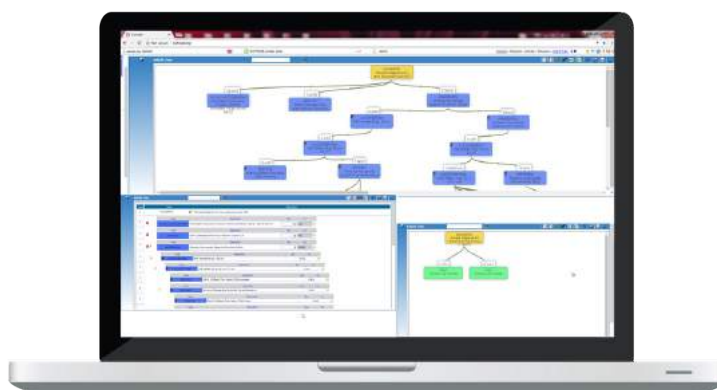
## Product Lifecycle Management (PLM)

As a starting point of Manufacturing 4.0 implementation, it is important to define a set of processes related to Product Lifecycle Management.

In this regard, SISTRADE offers features which contribute in a significant way to an efficient PLM. It is important to highlight that production management is mainly supported by the management of job orders, which have direct readings of all elements and processes defined by PLM.

### Main features of Sistrade® PLM

- Product technical sheet
- Bill of materials
- Bill of processes (routing)
- Version control
- Data repository
- Electronic work instructions
- Serial number management
- Simulation and cost estimation
- Product development
- Rules of storage
- Output priorities
- Tests and trials
- Control operation range
- Equipment settings



**Often these elements are stored in the actual Enterprise Resource Planning (ERP) software, which allows the integration with other software, through data import.**

## Job Order (JO)

A job instruction sent to the shop floor is designated by Job Order and can be issued manually or automatically through a registration of a client order or through the MRP (Material Requirements Planning).

### Main Features

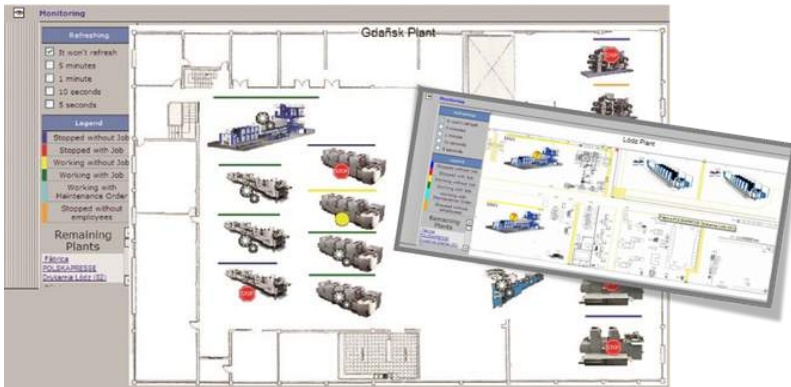
- Automatic generation through MRP
- Series and versions management
- Approval workflow
- Attach documents to support productive process
- Machine parameters
- Direct association with Technical Sheet
- Grouped JO
- List of materials to consume
- Production lot definition



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## Supervisory Control and Data Acquisition (SCADA)

SCADA is a web-based software, which retrieves data from operators, machine sensors, PLCs (Programmable logic controllers) and various devices within a plant, even in remote locations.



- Fully customizable
- Suited to each plant layout
- Multi plant
- Various sections
- Any type of resource
- Synoptic panels support

**SCADA has the ability to present a 3D plant of all machines, operators, and processes in real time, allowing to reduce unproductive time.**

### Main Features

- Local or remote supervision, multi-factory
- Actual information about the status of the machine operation
- Identification of employees who are working on the machine
- Production order that is in progress
- Quantities produced and rejected
- Operations carried out per job order
- Events and occurrences per machine and per job order
- Display of speed per machine in real-time
- Charts of speed history
- Automatic record of downtimes and their reasons
- Actual time of adjustment and production
- Analysis of profitability
- Occupancy rates
- Analyzing productive vs. unproductive time
- Efficiency per machine



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## Data Acquisition

The system provides a web based data collection that enables organizations to manually collect industrial data from industrial consoles, mobile devices or directly from machines and PLCs, applying the concept "Internet of Things".



### Information retrieved from manual collection

- Release of job orders (start/end)
- Start/end of operations (productive activities)
- Assign/withdraw employees to/from certain machines
- Reason of events (unproductive activities)
- Materials to be incorporated in the machine
- Production records
- Quality Control tests

### Why automatic data collection?

- Increased data reliability
- Minimize human error
- Better control of machine speed
- Reliable downtime record

### Ways to acquire data automatically

- Use proprietary acquisition cards
- Use standard PLC (for example, Omron, Siemens, ...)
- Use standard protocol (for example, OPC Server, XML, ...)
- Use relational database (e.g. SQL Server)



**Sistrade® software allows organizations to automate their production processes, and optimize their production lines and transform into a SMART FACTORY**

### Information retrieved from automatic collection

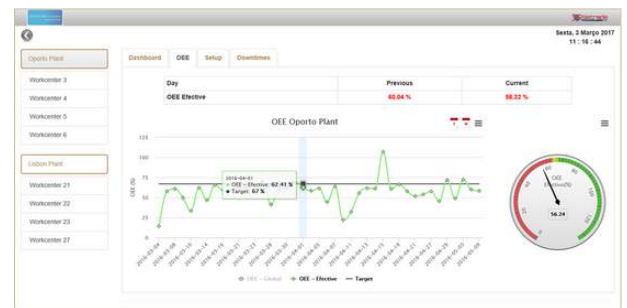
- Machine status
- Instantaneous speed
- Average speed
- Produced quantity
- Setup and production time
- Downtime
- Consumed quantity
- Other signals that can be relevant



# Manufacturing 4.0

## Kaizen Dashboard

Sistrade® brings Kaizen to the future, offering an interactive dashboard used to support the Kaizen implementation, substituting pen and paper dashboards with a highly dynamic and interactive dashboard.



## Main Features

- Setups chart
- Downtimes chart
- Interactive dashboards
- Clear identification of goal vs. result
- Graphical OEE analysis in different dimensions
- Touch screen display to support Kaizen meeting
- Analysis of setup times within a given time period
- Ability to immediately transmit the performance result
- Graphical analysis of indicators crossing different dimensions (machine, time, job order, shift, employee).



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## Andon Board

Sistrade® delivers a digital board displaying status changes of production lines and alerts when events happen.



## Main Features

- KPIs
- Notifications & alarms
- Delays and downtimes
- Current/next job order
- Customizable visuals to highlight parameters
- Events
- Target/real
- Good/waste
- Setup times
- Downtime

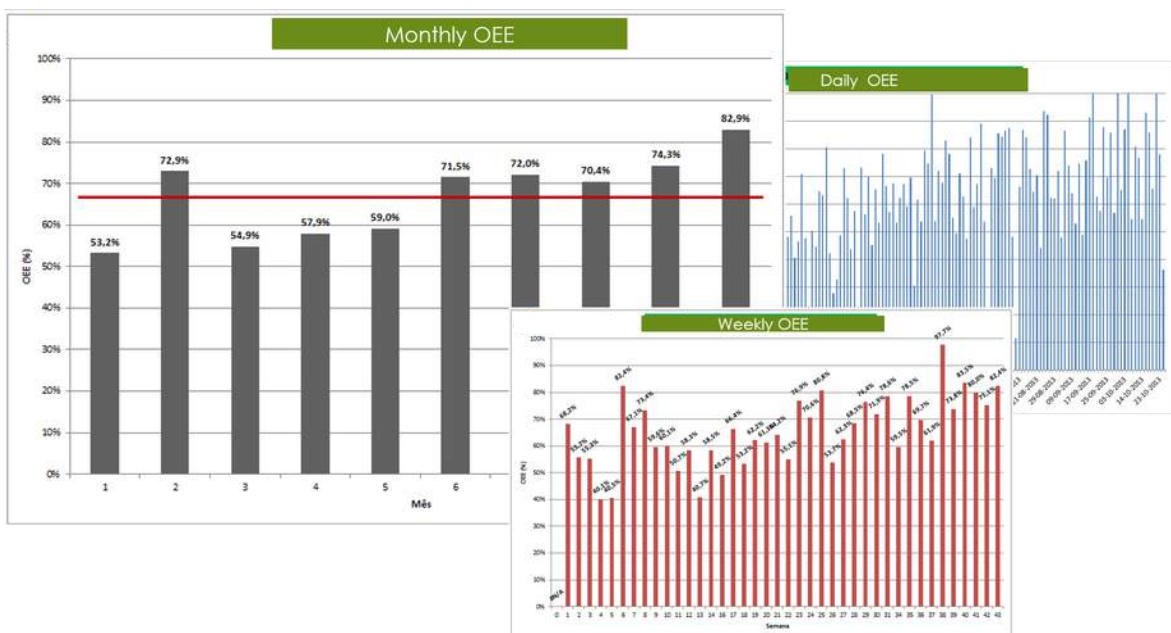
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## Overall Equipment Effectiveness (OEE)

Overall equipment effectiveness quantifies how well a manufacturing unit performs relative to its designed capacity, during the periods when it is scheduled to run.

Sistrade software delivers OEE supervision and analysis in real time in order to optimize production performance and efficiency, contribution for a company's continuous improvement.

$$\% \text{ OEE} = \text{Availability} \times \text{Performance} \times \text{Quality}$$



**OEE measures the percentage of planned production time that is truly productive.**

### Main Features

- Analysing current performance
- Downtime analysis
- Availability ratio
- Efficiency ratio
- Quality ratio
- OEE ratio
- Charts and analytics
- Optimizing efficiency and reliability of production processes
- Performance by shift, by machine, by employee, by day, month and year
- Others Key Performance Indicators



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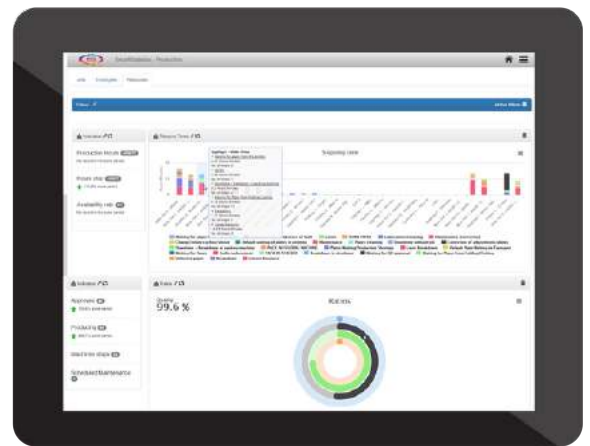
## Production Reports

Managing production requires a further analysis through interactive reports, in order to get insightful information to support managers' decisions.

Sistrade® Production Management brings Shop Floor Control to another level by providing detailed reports regarding production, employees and resources productivity.

### Main Reports

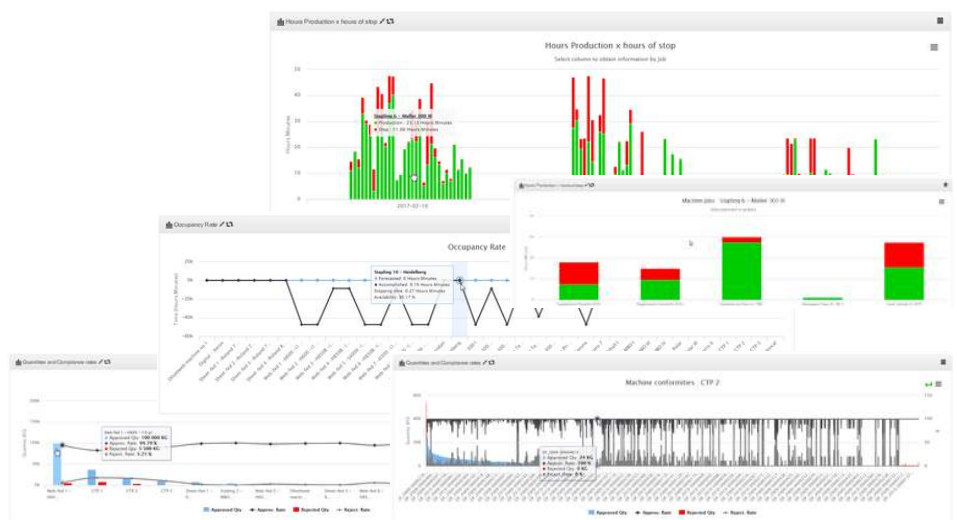
- Current machine operation status
- Real-time machines speed
- Speed history chart
- Automatic downtime record and cause
- Occupancy rates
- Consult job orders
- Machine and production time and its deviations
- Setup analysis
- Jobs in machine analysis
- History of machine productivity
- Tracking of production process
- Job order waiting times per section and operating summary
- Production data collection detailed registration
- Report employee productivity, presence and supervision control
- Analysis of resources and waste by JO
- List of needs
- SCADA 3D of plant layout



**Reports can be exported to another format (Excel, Word, PDF, etc.).**

### Dynamic Dashboards

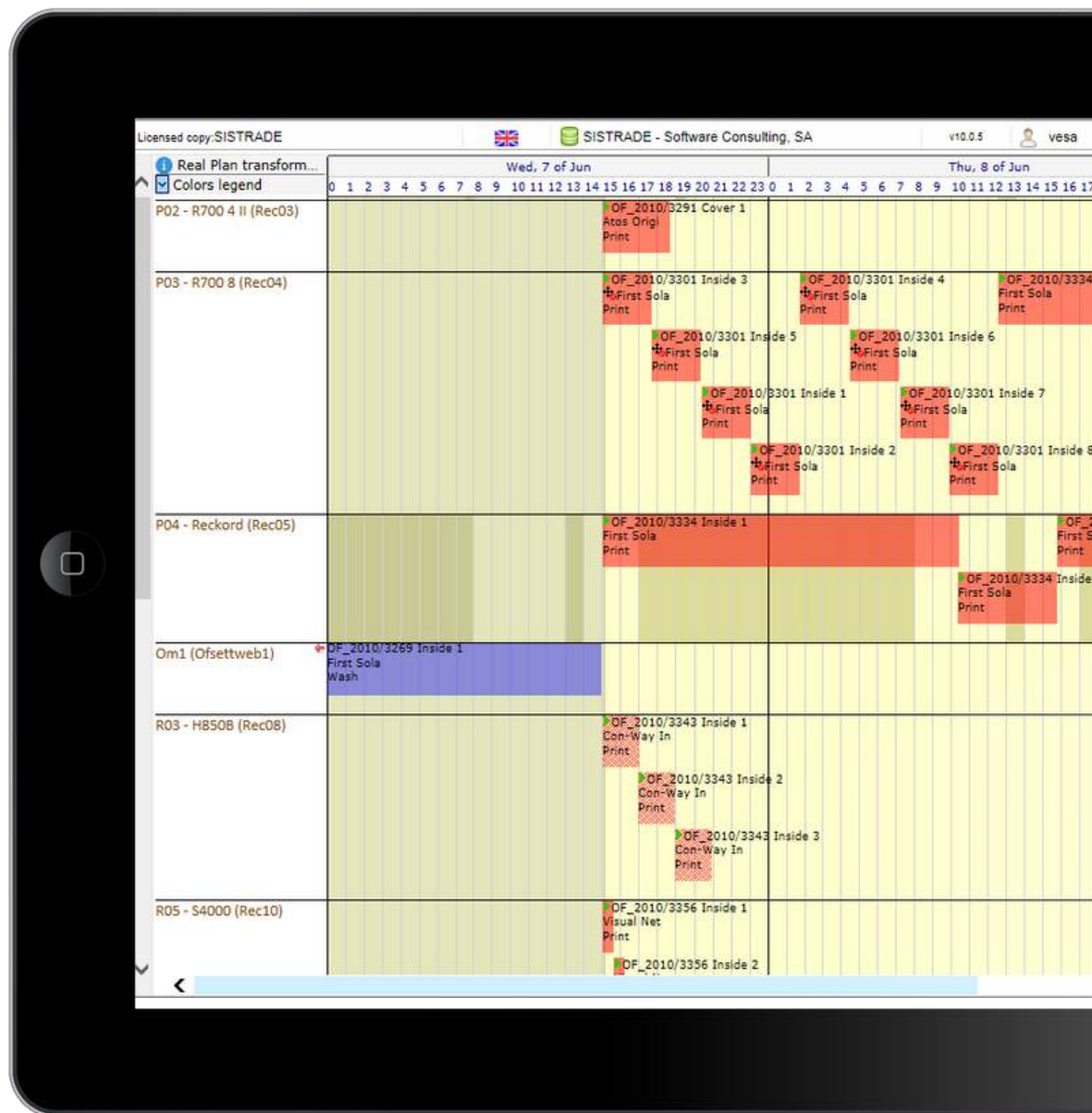
- Quantity and waste rates
- Quantity and compliance rates
- Ratios for OEE, quality, availability and efficiency



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## Scheduling

Sistrade® Scheduling offers a solution to organize all tasks and activities in an automated, fully interactive Gantt chart. The software has the ability to allocate machines and resources to its employees, offering a drag and drop feature, within the chart, resulting in a fully dynamic system.





## Main Features

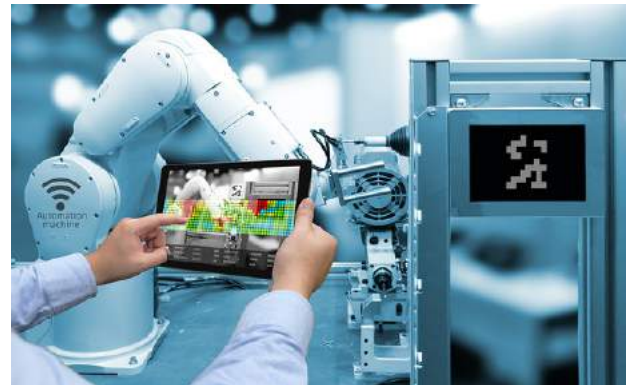
- Master plan of production
- Multiple Drag and Drop in Gantt chart
- Scheduling of the JOs and/or orders
- Visualization of job orders on Gantt chart
- Setting time of operations
- Subcontracting a particular activity
- Dynamic planning with indexing to the beginning/end and delays in production
- Synchronized with the production data collection
- Auto adjustment settings including delays and unexpected events
- Auto-optimization
- Integration with Stocks Management and Equipment Maintenance
- Easy employees/operations job assignment
- Matrix-based scheduling
- Integrated alarm system
- Simulation and comparison of production planning scenarios
- Report for controlling JO planning times
- Report employee productivity, presence and supervision control



# Manufacturing 4.0

## Productions record

Sistrade® is prepared to register products manually by the operator through the console, or automatically via PLC, by placing sensors on the machinery.



## Main Features

- Registration of produced quantity in the industrial console
- Registration of produced quantity via industrial automation
- Calculation of production using a function of production time or speed
- Connecting weighing equipment to determine actual weights
- Productions in two measuring units (e.g. meters and kilograms)
- Traceability of the production process

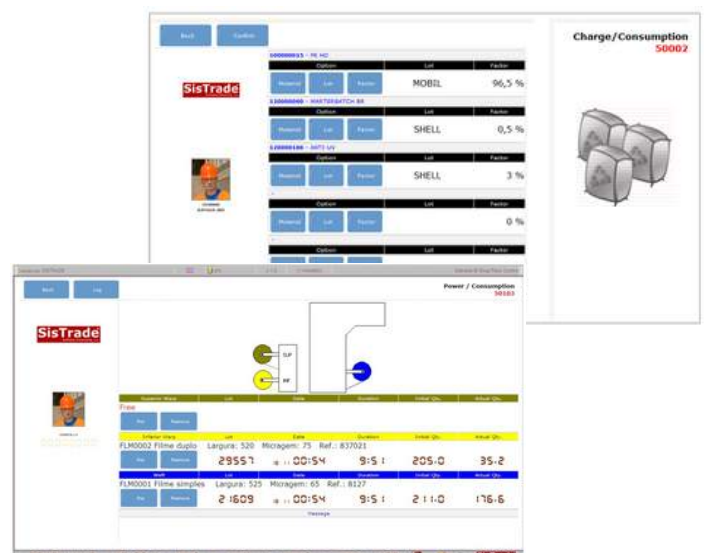
**Sistrade® software also allows connection to measuring equipment for measuring the recorded values, for example, the output of a machine or section may be placed on the scales for the system to record automatically the actual weight of a product.**

## Raw Materials Management

Sistrade® offers a complementary module to manage raw materials. This module consists of the definition of product trees, formulation, manual and automatic consumption, according to incorporation factors.

## Main Features

- Multi-level definition of product trees
- Manual consumption with barcode reading
- Automatic consumption based on the quantity produced
- Pre-confirmation of the outputs of stock
- Definition of the formulation with the start of the JO
- Instantaneous consumption per machine and per shift
- Various alerts for placement of raw materials per JO and per machine



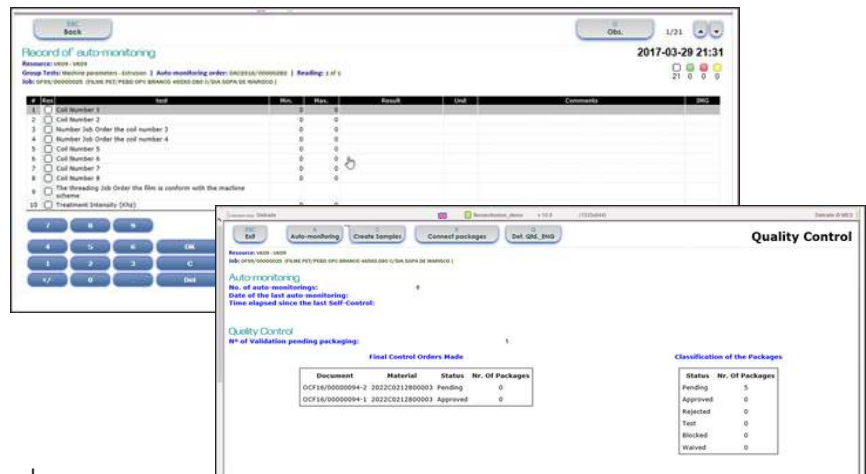
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## Quality Control

A company's reputation relies on its products and services quality, which requires a high degree of control to fulfil clients' requirements.

### Main Features

- History of quality control
- Statistics of reclassified products
- Quality certificates
- Alert system
- Conduct tests and testing groups
- Calibrations
- Control costs
- Traceability
- Real time reactive actions
- User-friendly interface for quality records
- Definition of tolerance intervals in absolute or percent value
- Configuration of quality parameters, according to the type of process
- User identification, date, time in which the test was done
- Interface optimized for touch screen and portable data terminal
- The possibility of connection to measurement equipment.
- Analysis of waste per shift and per job order
- Non-conformities per shift, per machine and JO
- Graphic analysis of defects



Sistrade® ERP offers a wide range of solutions in this department to improve product quality, focusing on detecting non-conformities, calibrating equipment, managing equipment costs. The software is prepared to respond in real time to all challenges, giving the user the possibility to record every information for future historical analysis. Additionally, this module is prepared to trace each equipment and material available, in terms of nonconformities, tests, and inspections.

### Dynamic Dashboards

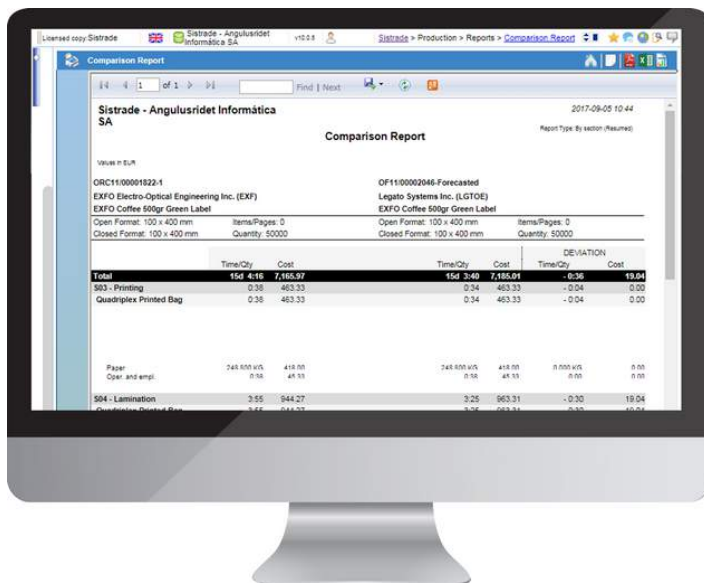
- Graphical interface
- Suppliers assessment by product family and subfamily
- Non-conformities



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## Industrial Costs

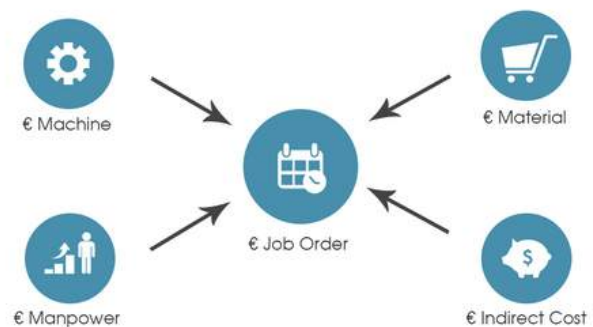
A production process can be very expensive, that is why managing industrial costs is a key activity for every manufacturing company. Summing up direct materials costs, direct labour costs and manufacturing overhead in production gives us the industrial cost of manufacturing. Sistrade® offers a solution to register every cost of materials, including indirect costs in order to calculate cost estimation closest to real.



**Managing industrial costs helps to support the decision to internalize or outsource certain value chain activities.**

## Main Features

- Job order real cost
- Work in progress cost
- Estimated/real cost comparison
- Order profitability
- Automatic update of default costs
- Distribution of indirect costs by manufacturing phase
- Distribution of indirect costs by cost centres

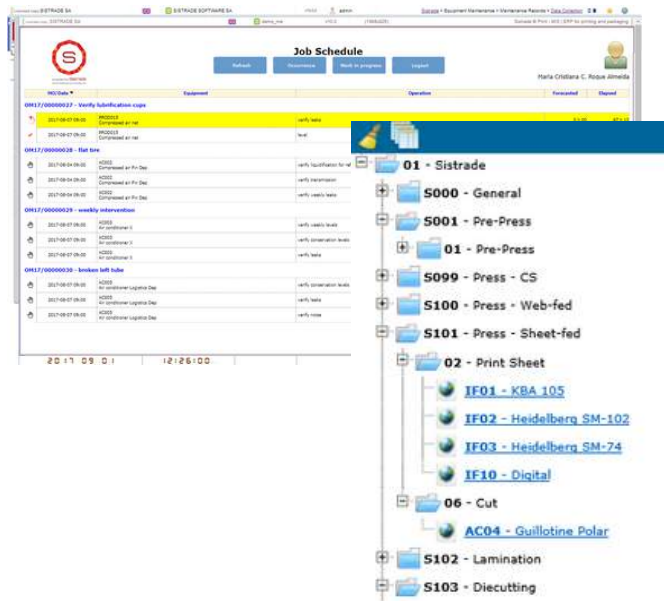




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## Asset Management

Asset management requires special attention from every organization, especially the ones, which have critical equipment as crucial investments. Poor asset management can lead to huge financial losses.



## Main Features

- Hierarchical structure of assets
- Equipment tree
- Detailed equipment sheet
- Automated maintenance requests
- Preventive and corrective maintenance
- Recorded incidents and interventions
- Integration with Scheduling
- Maintenance analysis
- Alerts for response times above default

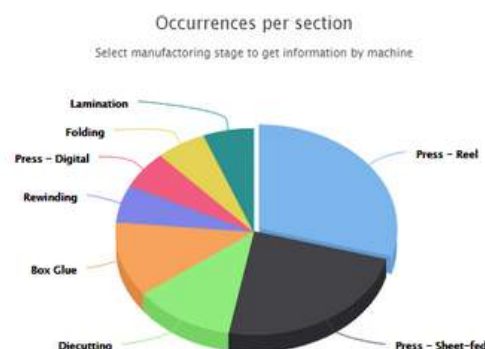
**This module delivers a 100% web maintenance control tool for all infrastructures, equipment, and components, including maintenance planning, management of all maintenance orders and preventive and corrective maintenance.**

## Main Reports

- Weekly summary of maintenance by employee/equipment
- Technical dashboard
- Equipment register
- Needs list
- Maintenance costs
- Maintenance records
- Maintenance plan

## Dynamic Dashboards

- Maintenance hours by machine
- Maintenance hours
- Occurrences by section
- Real vs predicted maintenance

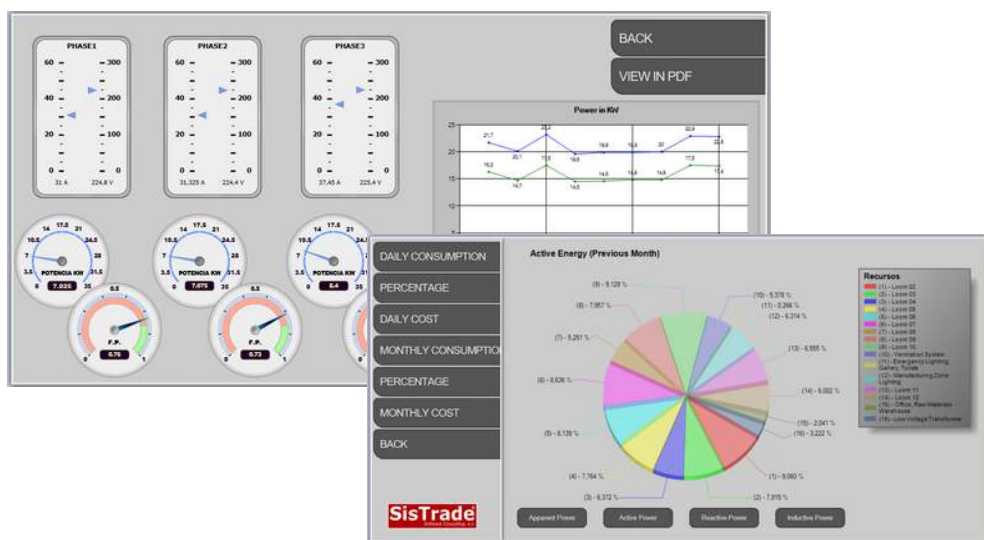


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## Energy Control

An energy management system tracks all energy resources and monitors energy cost expenses.

Sistrade® Energy monitors all energy related information regarding companies' equipment and machines in real time and offers an alert system to keep track of all unexpected events. This is 100% web available which means organizations can stay up to date with their energy resources consumptions anywhere and real time.



## Main Features

- Real time data monitorization
- Alert system
- Energy consumption display by manufacturing layout
- Web based software
- Correlation algorithms between the operating equipment and measured energy consumption parameters
- Query of consumption between periods of time, by analyzer, by shift, by section, and other filter criteria
- Control of the supplier's electricity invoice
- Cost estimation
- Elements of a given billing period, indicating the on-peak/ off-peak
- Energy, power, active and reactive energy
- Maintenance and configuration of the parameters and energy costs
- Records of energy cost per production cycle and time
- Comparison of cost and time per production and line

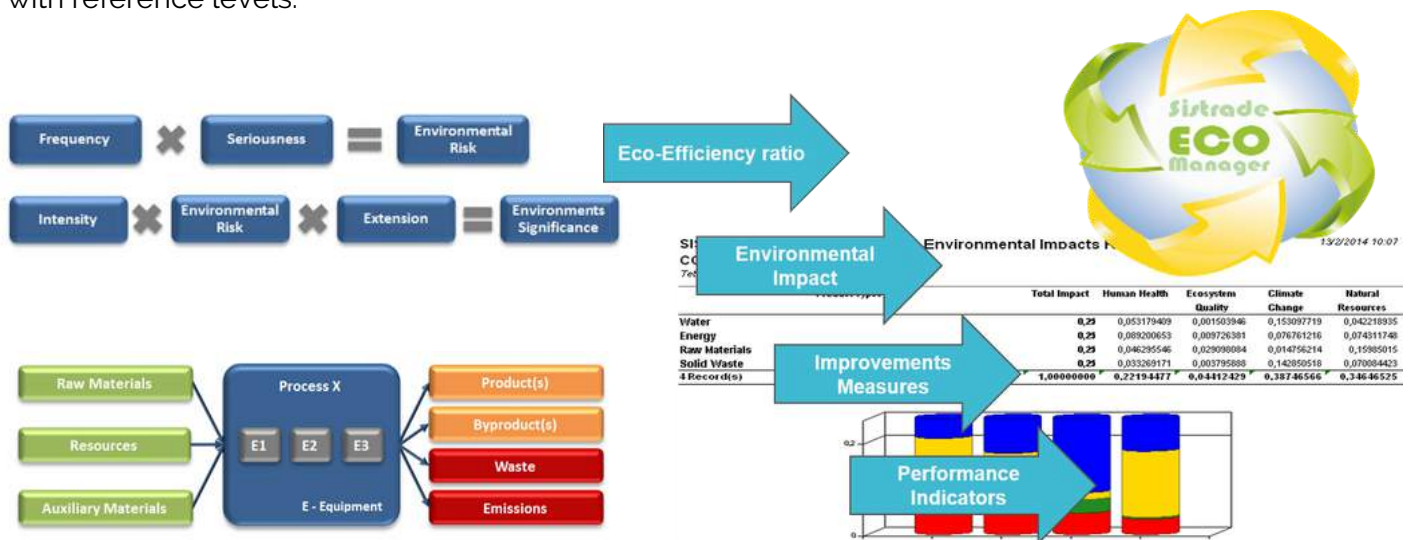
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## Eco Efficiency

Nowadays, smart factories pay special attention to the environmental footprint.

SISTRADe's purpose is to develop a decision support tool to characterize and improve the eco-efficiency of organization's production systems keeping in mind economic performance as well.

This module is prepared to simulate scenarios and generate performance benchmarks, compared with reference levels.



## Main Features

- Model of Environmental Impact Calculation
- Environmental Performance Evaluation
- Analysis of Mass Flow and Energy
- Value Calculation Model
- Simulation of scenarios and definition of economic and environmental goals
- Easy analysis/evaluation of mass balance and production systems energy (inputs/outputs)
- Methodologies for defining indicators of economic and environmental performance (KPI and KEPI)
- Integration of economic performance with the company's environmental performance (or processes) and generates the information necessary for the evaluation of eco-efficiency
- Presentation of results as dashboards (summary tables) of charts and tables based on the key variables for the user
- Generation of an economic and environmental profile of the company or process under study
- Depending on the results obtained, the user can set priorities and measure the most significant inefficiencies, which also allow the implementation of the improvement actions focused on reducing costs, on the more efficient use of resources and raw materials, and reducing the environmental impacts of the activity

# Manufacturing 4.0

## Business Intelligence

Sistrade® Business Intelligence is a tool that collects and compiles large amounts of data in order to generate relevant information regarding the companies' operations. Through this module, companies have a better understanding of the daily operations as well as their environment.

Business Intelligence has a wide application when applied to an organization, as for example, Business, Finances, Sales, Purchases or Production.



### Sistrade® Solution

- Perform analysis, by crossing multiple dimensions and metrics
- Apply filters to any dimension of analysis
- Results displayed analytically and graphically using any device: PC, tablet, smartphone
- Information updated hourly, daily or on weekly basis
- Set latency in order to generate, correct and updated data results
- Export data results to PDF, Excel and Word files

**Concerning production, an organization can use this tool to analyze historically KPIs for planning, manufacturing or even concerning quality or maintenance.**

### Main Features for Production

- Analyze deadline compliance rate, where the satisfaction rate between agreed delivery date and actual delivery is presented
- Analyze job order costs (actual cost vs estimated vs sales value)
- Analyze setup time rate, where it is possible to view the percentage of setup time over the total production, allowing the user to check the setup time of machines in order to carry out a given production
- Analyze the availability ratio: period of time the machine/section/plant should work vs time it is working





# Manufacturing 4.0 Solutions

## Commercial Management & Estimating

Estimating  
Customer order  
Shipment  
Invoicing  
CRM

## Stocks & Purchases Management

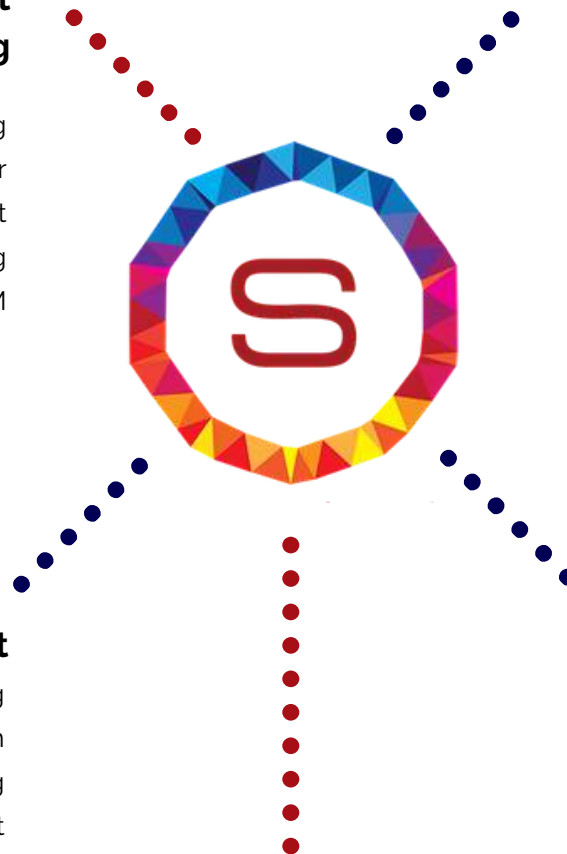
MRP  
Purchases  
Stocks management  
Suppliers management

## Production Management

Scheduling  
Data collection  
Industrial costing  
Job order management

## Administrative & Financial

Accounting  
Treasury  
Fixed assets  
Human resources



## Other features

Mobile Warehouse  
Equipment Maintenance  
Quality Control  
Ecomanager  
Energy Management  
RDI Management

Business Intelligence  
SmartStatistics  
Report Generator  
Web2Print  
Balanced Scorecard

# Manufacturing 4.0

## Worldwide Clients

Sistrade® MIS|ERP software is used by more than 3000 users, in more than 20 countries and spread over 4 continents.

Meet some of our clients using Production module:

### Edelmann

#### Edelmann

India

Edelman is a leading global communications marketing firm that partners with many of the world's largest and emerging businesses and organizations.



#### SOLIDAL

Portugal

SOLIDAL is a manufacturer of power cables and supplier of integrated solutions for energy transport and distribution.



#### CORDEX

Portugal

Cordex is a small but versatile global company with over 600 employees and product sales in 55 countries worldwide.





## MIRANDA & IRMÃO - Industrias, LDA

Portugal

MIRANDA & IRMÃO, LDA is a company with over 70 years of existence producing mainly bicycle and motorcycle components and solutions.



## SENTEZ AMBALAJ

Turkey

Sentez produces cardboard packaging, corrugated packaging and flexible packaging, using Sistrade® in all the company departments, from estimating invoicing, stocks management, job orders, production management and accounting.



**ekol ofset** package printing

## Ekol Ofset Printing

Turkey

Ekol Ofset is one of the leading companies in Turkey in the packaging industry.





powered by **Sistrade**

## **Porto - Headquarters**

Travessa da Prelada, 511  
4250-380 Porto - Portugal  
inov@sistrade.com

## **Lisbon**

Av António Augusto de Aguiar nº148 - 4ºC  
1050-021 Lisbon - Portugal  
lisboa@sistrade.com

## **Madrid**

Ribera del Loira 46 - BL 2 PL 0  
28042 Madrid - Spain  
madrid@sistrade.com

## **Paris**

Zone Orlytech Batiment 516  
1 allée du commandant Mouchotte,  
Paray-Vieille Poste, Paris, 91550, France  
paris@sistrade.com

## **Frankfurt**

Dornhofstr. 34  
63263 Neu-Isenburg - Germany  
frankfurt@sistrade.com

## **Ljubljana**

Rozna dolina, Cesta II/29  
1000 Ljubljana - Slovenia  
ljubljana@sistrade.com

## **Abu Dhabi**

Al Hilal Bank Building - Falah Street  
PO Box 129 354 - UAE  
abudhabi@sistrade.com

## **Warsaw**

Al. Niepodległości 69 - 7 °  
02-626 Warsaw - Poland  
warsaw@sistrade.com

## **Istanbul**

Dikilitaş Hakki Yeten Cad. Sel. Plaza,  
10/C Kat:6 Fulya  
34349 Besiktas - Turkey  
istanbul@sistrade.com