



Solutions for Cost Control



doeet 

The MES/MOM solution
for Industry 4.0

Doeet is one of the leading Industry 4.0 solutions for industrial digitalisation, production control, productivity improvement and cost reduction.

Doeet collects your manufacturing data in real time: production, productivity, quality, traceability, costs, maintenance and analyzes machine and operator information: downtime, units produced, consumption, scrap, wastage and rejects.



More than

20

years of
experience

More than

40

consultants
and technicians

More than

400

customers

Solutions for Cost Control

Doet has a complete cost control system to **know your real production costs** by order or reference up to the unit cost per product.

The system integrates and analyses the costs of **personnel, materials or depreciation**, as well as energy costs or manual tasks assigned to work cells and teams.

Connect your ERP with doeet to send work orders to the production plant and **know their status, consumption and costs in real time**.

Know the **real and theoretical productivity** of your machines and operators, through the universal OEE indicators of availability, performance and quality, in order to **optimise manufacturing processes and reduce costs**.

Among the doeet **Solutions for Cost Control** we highlight the **MES/ERP Integration, Analytical Costs, Energy Consumption, Calculation of OEE , Visual Factory and Control of Manual Works** modules and functions.





MES/ERP
INTEGRATION



ANALYTICAL
COSTS



ENERGY
CONSUMPTION



CALCULATION
OF OEE



VISUAL
FACTORY



CONTROL OF
MANUAL WORKS



MES/ERP INTEGRATION

The MES ERP integration allows sending work orders and knowing their status and consumption in real-time.

MES system with ERP integration

The MES ERP integration of the doeet MES system allows companies to **improve reaction times and avoid rework** in terms of allocating consumption and hours spent on each work order.

By connecting these systems we obtain **production data in real-time, reliably and objectively**, and the production reports are **100% digital**.

Send the day's production orders to each work centre

Doeet collects from the ERP the **information required in production** and sends it to the operator terminals at the machine.

All the data necessary for production are associated with the order: **article code, units, theoretical production times or machine parameters**.

- Send orders to be manufactured directly to the operator in the factory plant.
- Know in real time the status and actions performed for each work order.
- Automatically receive in the ERP all data collected in order.
- Anticipate the supply of materials by knowing the actual consumption.
- Eliminate paper generated by the management of production orders.



Upload consumption, labels and working documents

Attach to each order the details of the batches and expected consumption of raw materials or semi-finished products. This way you can control your stocks and obtain complete traceability.

Send with the order the labels to be printed with all the details of the order, and any other data that may be required in production.

Modify work orders and communicate them instantly

Sometimes we need to reorganize production and meet unforeseen orders or emergencies. Doeet allows partial closures of work orders to execute the next one or another with higher priority.

Send order modifications with one click and they will be instantly visible to managers.



FUNCTIONS

- ✓ Import of manufacturing orders to MES doeet from ERP.
- ✓ Import of consumptions, labels and documents associated with the order.
- ✓ Real-time data back to ERP: order status, costs, raw material consumption, quality.
- ✓ Automatic loading of orders.
- ✓ Sending manufacturing parameters and incidents to the ERP.

MES ERP integration with real-time order status

Doeet collects plant production data and returns order status to the ERP in real-time. This enables you to know at all times which orders are planned, in process, completed, on hold or blocked to react quickly.

Know the actual raw material consumption and production times for each order to analyze any discrepancy with the theoretical times in the production reports.





ANALYTICAL COSTS

Know your actual production costs down to the unit cost.
Breakdown by personnel, materials, machinery or depreciation.

Control **all your production costs**

Define your target manufacturing costs by category: depreciation, personnel, material or indirect costs.

Calculate the actual unit cost of each product and break down the factors contributing to its total cost. Any divergence between **actual and target costs** is reflected in the cost report.

Avoid costs due to **low productivity**

Know the percentage of **actual cost attributable to OEE losses**. The OEE cost report relates the production costs caused by losses in **availability, performance and quality** during production.

Analytical costing is a fundamental tool for analytical or cost accounting in industrial operations. The **manufacturing cost report** allows the investigation down to the smallest detail of the causes of nominal cost variances. The graphs in the report allow you to analyze in depth the real economic losses due to **stoppages, slow speed or quality failures** and their specific causes.

- Break down and control your direct, indirect, variable or fixed costs.
- Analyze in detail your actual costs globally, by order or by item.
- Know in real-time when the costs of an item in production deviate and their causes.
- Take steps to reduce your manufacturing costs and verify the results.



Breakdown your **fixed, variable and indirect costs**

Doeet considers all the factors involved in the production of each order to **calculate the actual cost of each order and item**: fixed, variable and indirect costs, and the sales value.

To know our actual costs and **profit margin** we must also consider the **actual production time, the good units produced or the cost of machines per hour**.

Costs **per item and per order**

Once the items and references are registered, you can edit for each of them their **fixed and variable costs and their sales value**.

The cost-per-order report shows **the actual cost to manufacture each work order**, accounting for all direct and indirect costs associated with the order.

Machine costs

Indicate the estimated **hourly cost of all machines** involved in production to know their impact on the final cost of each product.

FUNCTIONS

- ✓ Control of manufacturing costs globally and by production line.
- ✓ Unit cost per product and reference.
- ✓ Breakdown of direct, indirect, variable and fixed costs.
- ✓ Costing of semi-finished and finished products.
- ✓ Depreciation and personnel costs.
- ✓ Reports and graphs of actual production costs in real-time.
- ✓ Charts of deviation of actual costs from their targets.
- ✓ Cost deviation alarms.



DOEET GRAPHS OF COSTS DUE TO DOWNTIME, LOW SPEED AND QUALITY.

Your production costs **in real time**

Locate an item and doeet will generate a detailed report with graphs and data on its imputed costs. Doeet monitors all production data, **personnel, time, energy, consumption, rejects, stops, slowdowns, etc.**, thus having all the necessary factors to calculate with high precision the total costs of each manufactured product.

The doeet analytical cost module **calculates automatically and in real-time the actual costs** of the semi-finished or finished product. The **production cost report** allows you to analyze, down to the smallest detail, the causes of cost variances.





ENERGY CONSUMPTION

Control the energy consumption and costs in production, globally and by-products, and know and reduce your carbon footprint.

Control your energy consumption

Track all energy consumed in production, globally, by machine or by reference, and calculate the cost generated and CO2 emissions.

The doeet Energy Consumption module allows you to separately control any type of energy: electricity, gas, coal or renewables.

Reduce your energy bill

Add an energy consumption and indicate its cost per unit (m3 of gas, hydrocarbons, kilograms of coal) and its conversion factor to KWh. Doeet uses this data in its calculations of production energy costs.

The energy consumption report shows in different graphs the energy consumption and its cost per machine, per day or type of energy, to know and analyze your consumption to be able to reduce it.

Set alarms to warn of unusual consumption peaks or consumption in non-operational machines.

- Know the energy consumed by each item you produce.
- Analyze the cost of each type of energy and its effect on total production costs.
- Avoid energy costs not associated with production.
- Control your carbon footprint and comply with environmental sustainability requirements.



Energy consumed per machine or per reference

The energy consumed report shows the energy consumed in KWh for each machine or reference, the type of energy and its economic cost. Know the units manufactured with each consumption and the CO2 generated when producing them.

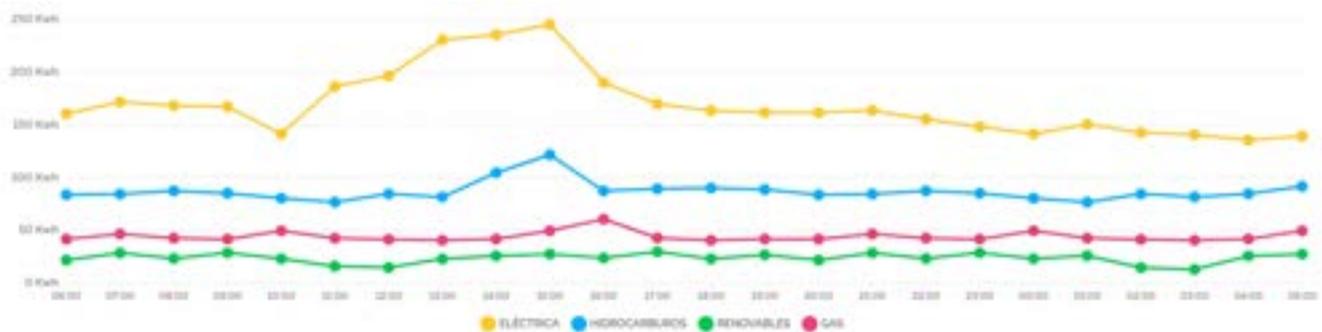
We can filter a machine or a specific period to go deeper into the detail of each energy consumption.

Configure your power system

Start by adding the consumptions to the system and then assign them to the machines. We must indicate, for each consumption, the unit of measurement (KWh, m3 of gas, hydrocarbons or coal) and other parameters, such as its economic cost or the carbon footprint generated.

FUNCTIONS

- ✓ Recording of energy consumed globally, per line and per item.
- ✓ Calculation of the energy cost for each type of energy.
- ✓ Generation of energy consumption reports.
- ✓ Calculation of the Carbon Footprint CO2 generated.
- ✓ Activation of alarms for excessive or unscheduled consumption.



GRAPH OF ENERGY CONSUMPTION IN KWH. BY TYPE OF ENERGY

Your energy consumption in real-time graphs

Control each counter, the total consumption, the hours of consumption, the CO2 factor or its cost in real-time.

The graphs of total energy consumption, by type of energy, total consumption in kWh or its cost per hour are constantly updated with the latest data calculated by the system.

Reduce your carbon footprint to be a sustainable company

Indicate the CO2 factor of each consumption if you want to know the carbon footprint generated by each product manufactured or your entire organization.

The control and reduction of CO2 allow you to access the ISO 14064 and 14067 certifications on Organizational and Product Carbon Footprint, a competitive factor valued by customers and Administration, and also in exports.



CALCULATION OF OEE

Measure the overall efficiency of machines and operators with the calculation of OEE in production and productivity KPIs.

Know your **real productivity**

OEE in production (Overall Equipment Efficiency) provides a **global view of the productivity losses** that occur during manufacturing processes.

The **OEE** doeet system collects all the data from your production lines and executes the necessary calculations to obtain the **OEE, availability, performance and quality** values, their deviation from their target value and their evolution over time.

Measure, manage, **improve** your OEE in production

Know exactly which **OEE indicator** is affecting your production efficiency **when it occurs and for what reason**.

Analyze the actual evolution of the productivity indicators and compare them with the established objectives. So you will be able to know if **a drop in production is due to a downtime or speed problems in the machines, or quality problems in the final product**.

- Analyze your production in real time with OEE indicators.
- Filter production data by line, reference, order or shift.
- Know the hours of walking and stopping, their causes and frequency.
- Know the actual units manufactured on each production line.
- Diagnose in which shift the speed drops of the operator or the reference.
- Analyze your quality and the reasons for defective units.



Control downtime on your lines

Analyzing the most common **causes of the machine and operator downtimes** and taking measures to avoid them will **increase the availability** of your machines and operators and **improve your productivity**.

Customize the most common **causes of stoppages** in your production and group them into categories; so that it's easy for the operator to rapidly **justify the stoppage at the machine** via the doeet terminal.

Your factory at high performance

Doeet **automatically counts all units produced** through sensors integrated into the machines or external PLC cards.

The system **recognizes the changes in times of references and calculates the average speeds** for each one and their deviations from theoretical speeds so that you know your precise performance.

Manufacture without defects and without scrap

Count the **products without defects** against the total number of products manufactured, **know the causes of failures** and take measures to reduce them and avoid rework.

Quality losses involve both energy and raw material costs as well as production time and reprocessing losses, in addition to the cost of discarding or recycling defective units.



FUNCTIONS

- ✓ Analysis of the global state of production with OEE indicators.
- ✓ Comparison of actual and theoretical production data and their evolution.
- ✓ Calculation of costs due to downtime or loss of yield and quality.
- ✓ Control of machine and operator status: running, stopped, non-operational, and analysis of causes of stoppages.
- ✓ Registration of units per machine, hour, reference, and operator.
- ✓ Justification of defective units and analysis of scrap causes.

All your data at a glance

Doeet has several predefined productivity reports ready to start analyzing your production: OEE, availability, performance and quality. Reports are designed to range from **general analysis to particular detail** in a few clicks.

Customize and **filter all your production data by line, reference, order, and shift**, to study in more detail the causes of lost productivity.

100% reliable and real-time data

Doeet obtains data directly from the machines (running times, downtime, units produced) so that production records are reliable and cannot be manipulated.

Knowing in **real-time and reliably the drops in production and their causes** enables us to take measures aimed at improving productivity. Once the measures have been implemented, we will review the data to verify if we have solved the problem.



VISUAL FACTORY

The visual factory improves the operability of production using real-time information panels.

All data in **full view of everyone**

The doeet Visual Factory module allows you to generate **large-format projections and screens** with data on the status of manufacturing, to be **viewed by all factory plant personnel**.

The displays show **machines running or stopped**, the **status of production orders** or the **overall efficiency of the equipment**.

Improve your **processes** with **information**

Communicate the **status of your production** by displaying in real time the status of all your machines. View your Visual Factory dashboards **from any mobile device and any location**, even off-site.

Sharing production status with your operators **avoids organizational problems** and improves the involvement of all personnel.



Visually monitor the status of your production at all times.

Customize the relevant data to be displayed to operators.

Share with the different operational areas what is happening in the factory.

Immediately report any production issues for a quick solution.



Visual factory with customizable panels

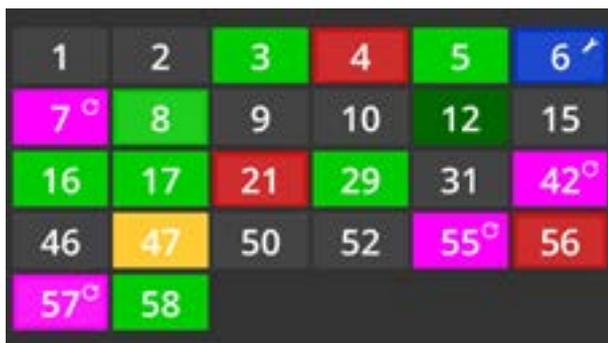
The objective of the visual factory is to provide **reliable, up-to-date and functional information** to improve the operability of production.

Five screen formats are available with different production data, from machine status and production orders to overall equipment efficiency, along with a colour legend defining asset statuses.

Create customized dashboards with the production data you need, **automatically updated** and focused not only on displaying relevant information but also on improving operability.

FUNCTIONS

- ✓ Display of panels with relevant production data and graphs.
- ✓ Visualization of production data in the factory plant or the office.
- ✓ Customization of the data displayed in the panels.
- ✓ Machine status indicators: stop, running, low speed.
- ✓ Visualization of the OEE productivity of each machine: availability, performance and quality.



Visual machine status factory

A grid with sections represents the machines of the production factory. The colour indicates the status of each machine: green in standby, red in shutdown, grey non-operational, orange in standby and blue in failure.

We can incorporate secondary data for each machine, such as the current downtime or the production order on the machine.

EFICIENCIA GENERAL DE EQUIPOS				
MÁQUINA	OEE	DISPONIBILIDAD	RENDIMIENTO	CALIDAD
GLOBAL	36.54%	36.54%	100%	100%
EXTRUSORA 1	92.427%	92.427%	100%	100%
EXTRUSORA 2	99.82%	99.82%	100%	100%
CELULA MANUAL 1	0%	0%	100%	100%
CELULA MANUAL 2	0%	0%	100%	100%
CELULA MANUAL 3	0%	0%	100%	100%

Overall equipment efficiency

Visualize in different bar graphs the current values of the universal production KPIs: the actual OEE efficiency, availability, performance and quality of each machine.

The display shows the values of the OEE indicators for all lines and compares them with the target values specified in the system.

ÓRDENES FINALIZADAS				
ORDEN	MÁQUINA	ITEM	CANTIDAD	FECHA
09.04	801 68	109998	ACETAL PVC 6L 7 (DOMAN) 3.25MM(L24)	2018
08.03	801 68	109905	PVC UNIFRAL 8011 METAL TL (812)	1812
08.02	801 67	109877	WORTH AD PVC 8011 TL PINCEL (81)	1809
10.04	801 281	109885	REPLUMB ADH PVC 8011 PL 25MM PINCEL	2018
03.14	801 68	109882	MB EXPERT ADH PVC TL 8011 PL 25MM (824)	2018
12.08	801 68	109876	PVC UNIFRAL 8011 METAL TL PINCEL (812)	1808
09.01	801 281	109894	REPLUMB ADH PVC 8011 PL 25MM PINCEL	2018
01.07	801 68	109881	PUM PLASTIGUAS AD PVC TL PINL 25MM (824)	2018
06.03	801 68	109875	PVC PSIGAFOR 8011 METAL TL PINCEL (812)	1804
01.03	801 68	109821	PUM PLASTIGUAS AD PVC TL PINL 8076 (812)	1801
09.08	801 68	109873	PVC S-16 8011 METAL TL PINCEL (812)	1804
03.14	801 67	109854	REPLUMB ADH PVC 8011 PL 25MM PINCEL (79)	2018

Panels of orders completed or pending be manufactured

These screens show, in a table format, the completed production orders, the next orders to be completed and the next orders to be produced. We can know for each order the start time, the machine, the item and the current quantity of good units produced.



CONTROL OF MANUAL WORKS

Assign manual tasks to your cells and teams, and get your manual job monitoring, their status and performance.

Know the efficiency of each operator

Doeet not only records the time spent by an operator on a given manual task but also measures its speed of completion, its causes of stoppage and the quality achieved.

Automatically record units produced and shutdowns

We can incorporate signals such as the count of units manufactured on the work or sorting tables.

In this way, in addition to counting the units automatically, doeet detects when the operator is in production or at a standstill, without the need for imputation.

- Create integrated manual work orders in a single system.
- Assign manual orders to cells and work groups.
- Get in detail the productivity of each operator and cell.
- Incorporate signals into your posts to automate the process.
- Add more modules and functions to your manual workstations.



Add **more functions** to your manual works

Add other doeet functions to the manual cell tasks such as **quality controls, manufacturing guides, documentation, low-speed warnings or visual factory access.**

The operator can carry the terminal with him at all times and access the functions of any of the doeet extension modules.

Record the activity of your operators

The doeet manual cell keeps a detailed **record of all jobs performed by each operator**, including the quantity and quality of the parts produced, the start and end time, and the hours and time of stoppages that have occurred.

Monitor the manual works control **in real time**

The manual cell records the **status of tasks and assigned operators in real-time**. This way we can know if there are operators in pause, the speed of each one or the order they are currently working on.

By combining the Visual Factory module with the Manual Works Monitoring module, we can **know the status of each cell and its tasks using coloured visual indicators.**

FUNCTIONS

- ✓ Creation of cells and manual work teams.
- ✓ Registration and assignment of manual tasks to cells and operators.
- ✓ Calculation of the speed and performance of each operator's activities.
- ✓ Recording of manual work stoppages and their causes.
- ✓ Real-time control of consumption and production of the cells.
- ✓ Display of the status of the manual orders in real time.

