

OUR VISION FOR INDUSTRY 4.0 INTEGRATION



ISSUE #03
2024

FIRSTLY

THANK YOU

FOR CONSIDERING US!

Contec is evolving as a key contributor to a growing and dynamic market, driven by Industry 4.0

By utilising the newest technologies and innovations in industrial automation we strive to grow with this market. We deliver state of the art automation systems to make our clients successful, as we believe their success is our success.

Contec delivers its services in an increasingly competitive environment, where IT and automation systems are converging, where talent is scarce and there is an increased demand for smart connected systems to deliver “big data”.

Contec differentiates itself by:

- Focusing on its client-orientated approach, independency in the market, delivery of high added value services and engaging employees in the company through financial participation.
- Incorporating high-level industrial IT and manufacturing software solutions
- Being present, locally, in different geographical locations across Europe
- Having strong partnerships with leading industrial automation suppliers such as Rockwell, Siemens, Honeywell, VMware, Wonderware, Schneider and Mobile Industrial Robotics (MIR).

We are here, ready to find solutions for your industrial automation challenges.

Patrick De Pryck
Managing Director (CEO)

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1

YOUR PARTNER IN CREATING THE FACTORY OF THE FUTURE

BRINGING INDUSTRY 4.0 TO LIFE

In today's world digital networks already form a vital part of everyday life. Technology is constantly evolving at a rapid pace. At Contec we continuously monitor and evaluate new technologies and products.

Every project is a creative process; a search for the best possible solution tailored to your needs and means. Within the world of fast moving technologies and multiple suppliers, we are your partner that can help bring it all together.

We can't predict what factories will look like in 10 years from now. We couldn't predict it 36 years ago either. However we have always succeeded in co-creating the future together with our clients and continued to help them grow to their fullest potential.

INDUSTRY 4.0

2 | INTEGRATION ROADMAP

Today's markets are demanding high flexibility and quality. In order to help operations respond to evolving market requirements and new innovations, it's important to set up a properly integrated MOM-layer. Together with our customer, we create a custom-tailored masterplan (a blueprint and the roadmap towards it) for integrating and rolling-out such MOM solutions in any production related department. A strong focus is given on full digital integration of work processes using efficient and innovative technologies.

The prerequisites for this masterplan, are the assessment of the customers existing installed base and their functional requirements (as-is and to-be). Next, by following a pragmatic approach, the integration phases are determined. These support on the 4 main levels of integration:

1. CONNECTIVITY

2. INTEGRATED - AUTOMATED (reactive approach)

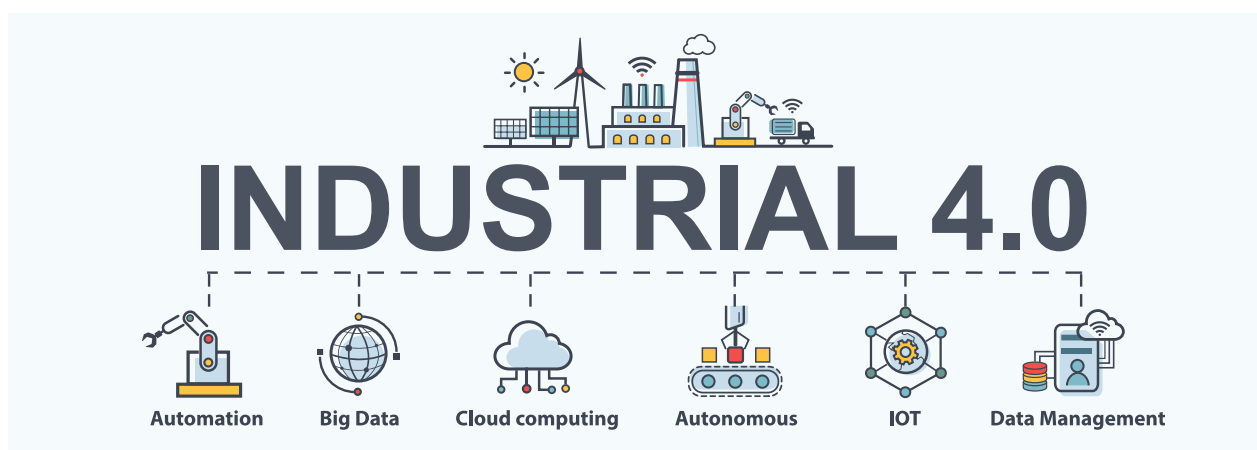
3. ANALYSIS/BI/ML/PREDICTIVE CONTROL (proactive approach)

4. FULL ADAPTIVE AUTOMATION

Most companies today find themselves in or between levels 1 and 2. The integration roadmap will bring your operations gradually towards higher levels, and as such towards your ultimate goals. These can usually be summarised as:

- › A fully digitized shopfloor
- › The use of efficient and effective technologies
- › Easy adaptation to changes in market requirements
- › Easy adaptation to and integration of changed technologies

The means to achieve this is to integrate a software backbone and data-model in which (work) processes and interfacing to different technologies can easily be integrated. Allowing you to gradually move towards a fully automated and autonomous production facility.



OUR MOM DEPARTMENT

MANUFACTURING OPERATIONS MANAGEMENT



MOM

More than ever manufacturing companies need stable software platforms that are flexible, efficient and most of all easy to use. Our MOM team has more than 20 years of experience in designing solutions to increase productivity.

The journey to a fully digitised plant requires several steps from concept to phased integration. Contec can guide you as an independent integrator starting from a feasibility study to a possible implementation.

We start projects by creating a blueprint based on **ISA-95 guidelines**, the international standard for developing automated interfaces between enterprise and control systems. Then we support you in choosing the software modules and technology best suited to your needs.

We are able to develop solid and tailored MOM layers within your plant(s) and across plant sites which takes your production to the next level of manufacturing excellence and industry 4.0 standards.

The ultimate goal is to provide the production floor with a digitised platform where attention is focused on:

- › Easy integration of all kinds of systems
- › A single operator platform on the production floor
- › Flexibility for customer specific production applications with the necessary quality assurance

GUIDANCE TO THE DIGITAL FACTORY

We guide our clients in their important technological choices and integration to make optimal use of their production assets. Together, we supervise and integrate any required operations resources and work processes. Such a process requires a pragmatic approach of which the ultimate objective is to integrate the production floor and (work) processes in such a way that both old and new technologies can be linked easily and correctly. In this way you ensure maximum return and efficiency.

SUSTAINABLE FACTORY

A complete digitisation of production requirements lays the basis for optimisation and analysis of the required sustainable needs such as: electricity consumption, steam consumption, optimisation of planning, paperless factory, feasibility studies for new initiatives

DIGITAL FACTORY

By optimising and digitising processes, we can use new technologies such as AI and deep learning to optimise energy, quality and production efficiency.

OPTIMISATION OF PRODUCTION LEAD TIMES AND WIP

In particular, the requirements for MES and integration with existing production assets are considered. These assets will be enriched with an additional MES-MOM layer, fully ISA-95 compliant, enabling the following functionalities:

- › Master data analysis (ERP and MES-MOM)
- › Planning (APS)
- › Production efficiency (OEE)
- › Recipe integration
- › Production optimisation
- › Performance optimisation
- › Quality optimisation (fast-automatic production order release)
- › Integration with ERP

ADVANCED MANUFACTURING

Integration of the following activities:

- › Fast changeovers thanks to advanced recipe modules
- › Integration optimisation through AGVs, cobots and robots
- › Integration of specific devices via industry standard protocols, e.g. vision systems.

SMART WORKFLOWS

To guide operators in their daily tasks, we take care of integrating their work processes into a fully digital workflow. All registrations are stored digitally for later reference. This allows optimisation and possible AI initiatives. Contec has its own framework for digitising such activities.

SERVITISATION

In addition to digitisation, the demand for support and leasing of assets has also become an important part of daily production. Contec assists clients in providing the right data at the right time, with the required security assurance (connectivity).

CONNECTED FACTORIES

Integration of the right production-level software layer simplifies the complexity of integration processes at the ERP level. Which in turn leads to simplification and flexibility on the shopfloor.



4.1 THE REASON OF EXISTENCE

Over 35 years of experience as an independent solutions provider and systems integrator working with many large multinational clients within the manufacturing sector, has enabled us to gain significant insights into the increasing challenges manufacturers are facing and the solutions they require to meet them. Today, manufacturers are trying to cope with the high demand of customer market initiatives requiring production facilities to adapt immediately. This leads to new technologies and constantly changing production requirements to cope with the market demands. The strategy of using a dedicated software product (technology) is at risk due to inflexibility and reaction time to market changes. This is one of the main reasons why we at Contec developed our production management solution (CPMS).

CPMS is a light weight framework fully compatible with industrial standards allowing us to modify production processes immediately, connect any equipment or legacy system and integrate new technologies on the spot.

We also see it as a commitment within our own company to invest in standards that allow us to serve our customers in the best way possible. CPMS is integrated within our standard integration services to deliver a high quality and standardised solution to our customers.

4.2 OUR VISION

The vision of the platform is to become the central platform within the operation area to fully integrate all work processes. Within this setup, CPMS becomes a toolkit for continuous improvement and innovation initiatives.

The framework is the ideal supporting platform to embrace LEAN manufacturing processes with direct focus on:

- › Waste management
- › Integration of pulling operation methods to reduce WIP, inventory and overproduction where possible
- › Throughput improvements
- › Realtime, immediate quality control interaction

CPMS is designed to be the best-in-class software framework for smart factory digitization, continuous improvement programs and innovation initiatives.

4.3 FOCUS ON INTEGRATION

1. The ultimate data model

Having a strong, flexible data model is the foundation for any digitization or digitized improvement program. As the data model of CPMS is consistent and designed specifically to digitize work processes and flows, the model becomes the ultimate data container for advanced scheduling, analysis, optimization, and artificial Intelligence initiatives (AI).

2. Mould your production facility into our tailored data model and functional layer

Production processes can have very specific requirements and can be very demanding. The diversity in which products can be created with different assets, at different locations and within different cultures, can also require specific concepts to implement digital work processes. Creating a functional implementation layer (CPMS) at the shopfloor allows local production teams to create and adjust their own work processes and initiatives to deliver enterprise driven targets.



3. Create a single operator user interface at the shopfloor

As CPMS can communicate with any device, with any software component, it is our vision to position CPMS as the sole user interface for the operator at the shopfloor. One user interface will allow easy adaptation to change and improvement programs. Operators-supervisors and lead engineers will focus on operation process improvements instead of what technology to use. CPMS becomes a constant enabler for further automation as it is used as the sole data entry point.

4. Move towards “Lights out factory” principles

By experience we know that today's production facilities are going through constant changes, improvements or market requirement adaptations. This requires a solid masterplan with focus on the latest technologies to upscale your operational performances.

CPMS is built to allow a holistic approach to move from non or partly integrated shopfloors to fully automated work centres. CPMS is designed to embrace any new technology. The buzz word “Lights Out Factory” becomes part of your daily work to keep improving current processes with today's and tomorrow's new technologies.

4.4 ARCHITECTURE

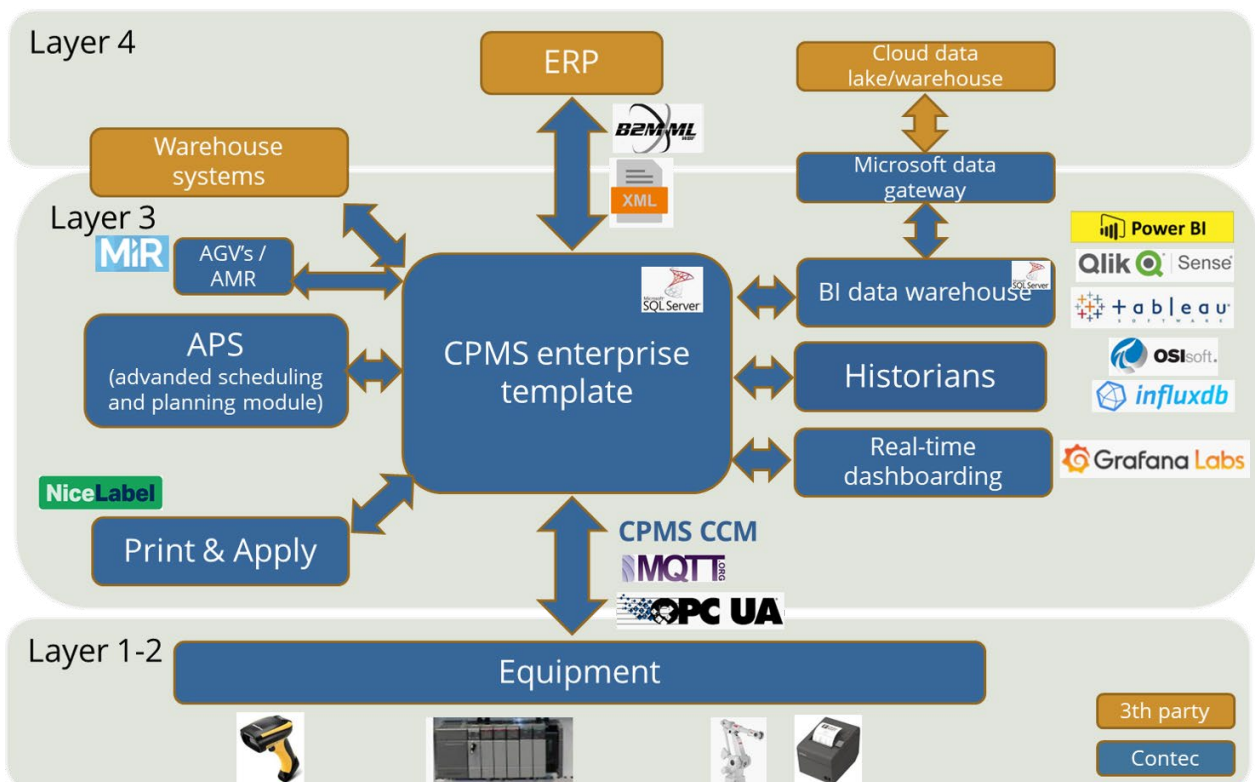
CPMS is designed to become the single user platform at the production-terminal facility for automated and manual operations (production, logistics, maintenance, or QA related). Due to full compliance to ISA-95, we deliver a highly open, common, and flexible architecture.



Integrating the best available market niche technologies and products is key to our project approach. We embrace and integrate these technologies that suit the best for our customer needs. This means that indicated technology providers are solely given as potential reference.

Additionally, while embracing other technologies, we build our own eco-partnership network from which our customers can directly benefit.

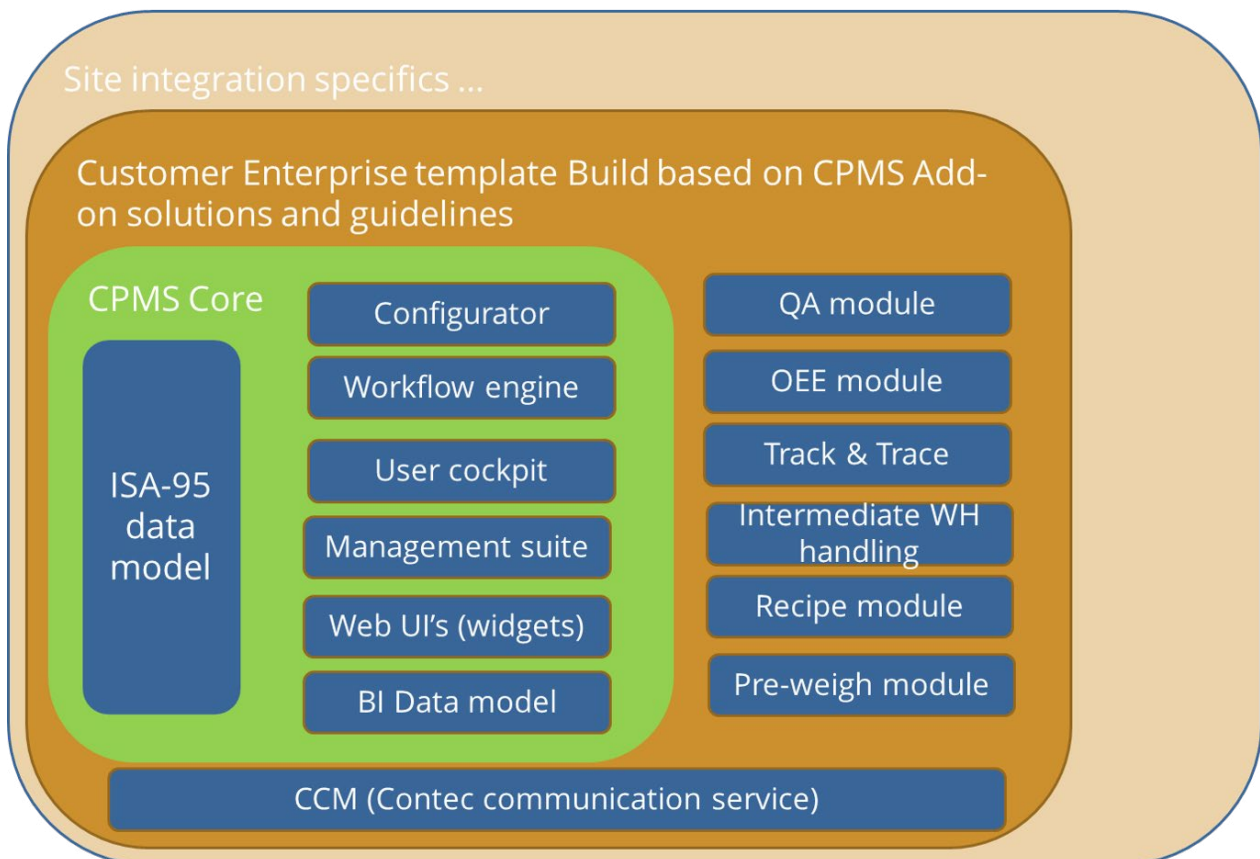
CPMS ENTERPRISE FRAMEWORK



4.5 PROJECT INTEGRATION APPROACH

CPMS is a framework that can be integrated in many markets. The framework exists of a core module containing following components:

- › The database model
- › The configurator: the user interface for configuring resources and workflows
- › The cockpit: the user interface towards the operator
- › The core workflow nodes (standard and configurable) and their interface widgets
- › The workflow engine
- › The communication server: layer 1-2 interfacing backbone
- › A management portal: the user interfaces for reviewing operational data
- › BI data model
- › Dashboard module



Preconfigured add-on modules are available and can be added when required. It is the intent to deliver a customer configurable software framework from which the specific requirements can be integrated. For enterprises using CPMS in different site locations, it is the intent to build an enterprise template and adapt it to or extend it with specific local needs within the site's instance. If necessary, they can of course be incorporated within the enterprise template.

4.6 THE CORE: DIGITIZATION OF WORK- AND PRODUCT FLOWS

This is the centerpiece of CPMS, allowing a (key) end-user to define or modify workflows to be executed by operational teams or machinery against operations requests (process orders).

Work requests (CPMS internal 'orders') are defined from operation requests (like ERP process orders) and consist of a workflow of **jobs** (production steps, like 'change machine settings'), which in turn consist of a workflow of **tasks** (specific checklist/work instruction, like how the machine settings should be set).

All data (input values, times, executor...) is stored in the database and can be brought together in reports for traceability, performance... or can be sent to other applications. This data can be pulled from operator inputs, connected measurement tools, scanners, machines, PLCs or other applications (ERP, WMS...).

Operation(s) (refer to the 'O' in MOM) is defined by the ISA-95 standard as the generalized term of manufacturing related operations in:

- > Production
- > Quality
- > Maintenance
- > Logistics
- > Any combination of the previous

And so, workflows can be setup which are related to these operations and can apply to the respective departments.

Digitized and cross-department integrated work processes are the base for moving to a 100% automated production facility

CPMS Cockpit - Job Center Work Requests **Job Center** Default Administrator

Work requests Search: Actualiseren

ID	WR ID	Operations Request	Jobomschrijving	Starttijd	Gepland einde	Work Center / Unit
980864	12839	900241009	Packing - Visuele inspectie VQS	19/08/2021 07:27	19/08/2021 08:57	110 - 01 - 010101
981208	12839	900241009	Packing - Begin Shift - Challenge+Parameters	19/08/2021 14:00	19/08/2021 14:30	110 - 01 - 010101
981209	12839	900241009	Packing - Begin Shift - Allerteil	19/08/2021 14:00	19/08/2021 14:15	110 - 01 - 010101
981288			Cil - 110A - wekelijks	23/08/2021 09:20	23/08/2021 11:13	110 - 01 - 010101

Showing 1 to 4 of 4 entries 1 row selected

Taken

ID	Numer	Omschrijving
2445990	VQS2.2	VQS-controle QMS

VQS-controle QMS 2445990 - VQS2.2

Categorie: Doos Cel Kaart Steekproef

Defect: Incorrecte Versheidsdatum (D4)

Klasse: Maak een keuze... Oorzaak: Maak een keuze... Aantal: Aantal... + Toevoegen

Geschiedenis

Defect: Aantal Klasse Oorzaak

No records added...

Opslaan

4.7 PLANNING AND SCHEDULING OPERATIONS

Optimize your assets, product quality and work processes by integrating CPMS with on-the-market detailed scheduling technology.

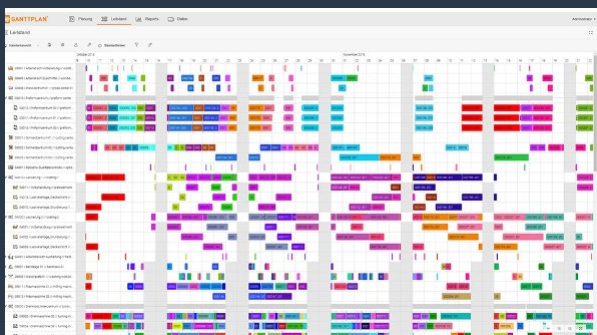
Configuration features to link operations against required resources (material, equipment, people allocation) are standard in the core module. As standard CPMS functionality we include the ability to combine and sequence work requests from connected enterprise modules to allow work planning.

In case more specific planning and scheduling requirements are required, we integrate available on-the-market APS systems like Dualis within the required setup.



KEY FEATURES

- › Rapid changes to orders with drag and drop
- › Easily integrated using import and export
- › Detailed information about individual orders
- › Simple control rules for detailed planning
- › Displaying different diagram views to visualize planning
- › Planning of resources, orders, utilization and inventory
- › Connecting to production systems to identify deviations from plan
- › Easy integration by data import and export
- › Change-over logic integration to improve efficiency



BENEFITS

- › Reducing costs and time for planning and enabling a detailed production planning
- › Reducing stocks and improve WIP KPI's
- › Improving reliability regarding time and quantity of delivery
- › Increasing transparency for better and quicker decisions
- › Optimizing planning by comprehensive and detailed overview
- › Increasing flexibility in planning and execution
- › Informing in detail by visualizing planning data of all process steps
- › Reducing lead times
- › Displaying resource utilization allowing to adapt/optimize quickly
- › Integrate easily urgent rush orders

Transform your operation scheduling requirements from human interaction towards automated business processes.

4.8 PRODUCTION INTEGRATION

The framework integrates and automates your production and daily work processes. CPMS keeps track of your everyday operation with required time and resource registration allowing deep analysis and improvements on the key components of Lean manufacturing like:

- › The value stream mapping of processes
- › Total productive maintenance (TPM)
- › SMED (Single minute exchange of die) meaning focus on extremely rapid change overs
- › Kaizen continuous improvement processes
- › Just-in-Time operation triggering to keep the user focused at prioritized work



CPMS as the base for lean manufacturing and the continuous pursuit of perfection.

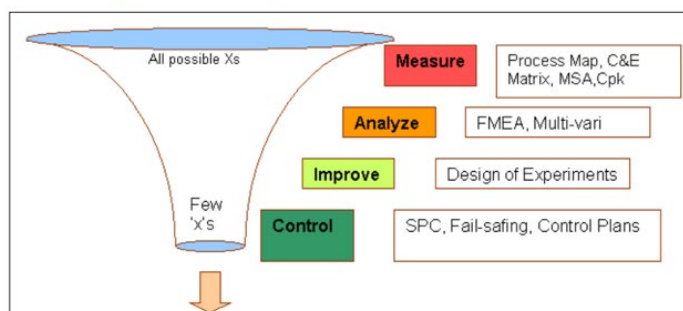
The similarity between the Six Sigma methodology and the integration of industry 4.0 is significant.

Consider for example the philosophy of reducing variability: for operations this could refer to the variability in work process duration or even in how they are executed. Integrating CPMS allows your operations here to:

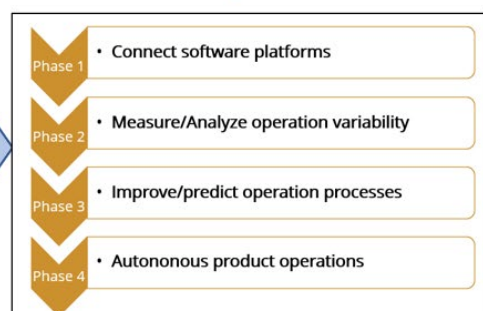
- › Measure required operation times
- › Analyze and integrate improvements
- › Link back measurements and business logic with advanced schedulers to predict viable and reliable operational plans
- › Fully automate operation and run autonomous

As 6 sigma tools get the variation out of your process, CPMS is the tool to get your variation out of your operation work allowing better planning, better J-I-T processes, less lead times, more throughput and less WIP.

Six Sigma for processes

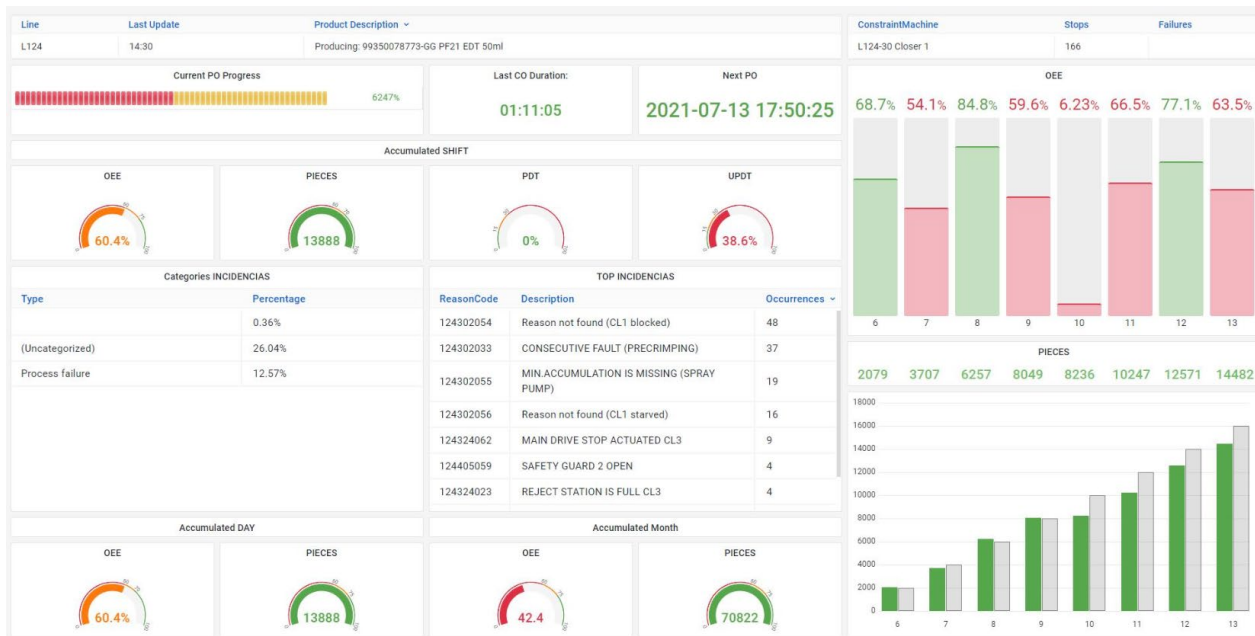


CPMS for operations



4.9 OEE ADD-ON MODULE (PRODUCTION EFFICIENCY)

CPMS can be delivered including configurable functional modules. OEE (Overall Equipment Effectiveness) is one of them. It gives you a direct focus on the performance of your resources. Still, however, the range of OEE functionality requirements can be broad. That's why our OEE module is designed to be supplied in many flavours and includes aspects of the wide-ranging functional requirements encountered over the 20+years of experience in factory automation and optimization.



KEY FEATURES

- › Real-time data capturing to identify deviations from plans as quickly as possible
- › A set of business oriented KPIs / best practice performance figures are provided
- › Current and historical process values and states, as well as individual trend displays, can be accessed by all process staff / decision makers
- › Numerous diagram types and freely configurable reports to display and document the data recorded
- › Detailed logging of short interruptions and speed reductions in filling and packing systems
- › Root cause analysis of downtimes caused by connected up- or downstream equipment
- › Downtime registration against predefined tree lists
- › Ability to link downtime registrations against machine specific components

BENEFITS

- › Performance optimization of all connected machines at a production site using an integrated approach
- › Key figures to reduce servicing costs and improve plant uptime
- › Measure the overall plant efficiency (OEE) to minimize unscheduled downtime and increase productivity
- › Reduction in material- and product throughput times
- › Increased sustainability of machines

Every installed base has specific requirements. CPMS OEE can be integrated in many flavours.

4.10 QUALITY CONTROL

As CPMS is the platform to digitize work and operations, certain of the activities can be marked as quality related activities. All quality operations can be preconfigured and designed with their own specific business logic in mind. Key object of the integration is twofold:

- › Handle a quality issue immediately when it happens, detect issues in the early phase.
- › Approved product quality release immediate after production (automatically or manually)

KEY FEATURES

- › Real-time data for the fastest possible identification of variances
- › Modules for data capture, analysis, evaluation, and communication
- › A set of business oriented KPIs / best practice key indicators
- › Current / historical process values and states, as well as individual trend reports
- › Numerous diagrams and freely configurable reports to display and document the data captured
- › Dashboard and Standard Reports
- › Direct integration for issue escalation rules
- › Integration of AQL, SPC and other Six Sigma principles

BENEFITS

- › Detailed evaluation of 'out-of-specification' states
- › Optimization of all a production site's quality and production processes through a standardized approach
- › Reduction of the error costs and hence a reduction of the overall quality costs
- › Increased quality through a detailed 'out-of-specification' evaluation for all process steps
- › Increased customer satisfaction through early identification of specification variances
- › Better information levels by providing all relevant data to the various management levels, from production operators to plant management
- › Increased productive working time using mobile devices
- › Digital integration of rework processes of production orders

Quality Control KPI Dashboard Showing Defects ...

The use of automated or auto-triggered quality registrations and integrated out-of-spec reaction plans, assures higher levels of production quality



4.11 LOGISTICS-WAREHOUSE-LINE SUPPLY

As any operation can be digitized or automated with the use of CPMS, also work processes related to logistics can be implemented. For example product receipt and identification, line supply- line takeaway, Kanban processes and others can be integrated. Nevertheless, side activities like truck receipt and loading, preweighing, material kitting and others can easily be integrated within the platform.

With strong integration focus on other department's work processes, CPMS supplies immediate added value from its data driven data model and integrated design (1 fits it all).

Automation of product flows (or inventory moves in general) can be optimized using AGV or AMR systems, like MiR (Mobile industrial Robots) and integrated into CPMS to seamlessly bridge the gap between production and warehouse.

Seamlessly integrate the product flow between production and logistics areas

KEY FEATURES

- › Kitting possibilities for optimized production line supply- line takeaway
- › Material requirements and availability planning, based on actual material consumption at the allocation and usage areas
- › Storage locations and regions are freely configurable
- › Manages the inventory of storage locations and consumption, as well as transport requests for raw materials or finished products
- › Mobile- and barcode-aided logging of all current stocks, in order to compare estimated and actual stock levels in an annual inventory check
- › Where appropriate the actual stock levels can be transmitted to compare with the balances in an upstream ERP system
- › Kanban strategies are included in the system (monitors, material availability, etc.)
- › Control of planning on the basis of real-time key figures
- › Direct integration with AGV/MiR platforms for automatic production supply



BENEFITS

- › Accurate inventory data resulting from integrated systems (e.g. material consumption booked during the weighing operation)
- › Integrated data transfer & communication
- › Logistics KPI monitoring & reporting
- › Inventory levels always up to date for material planning and procurement
- › Automatic data exchange with ERP
- › Stock levels controlled with the selected materials management strategy, e.g. FIFO, Kanban
- › Material supplies to production according to current consumption (just-in-time delivery)
- › Cycle times are reduced by time savings in warehousing, relocations, and the provisioning and availability of materials
- › Optimized production supply chain

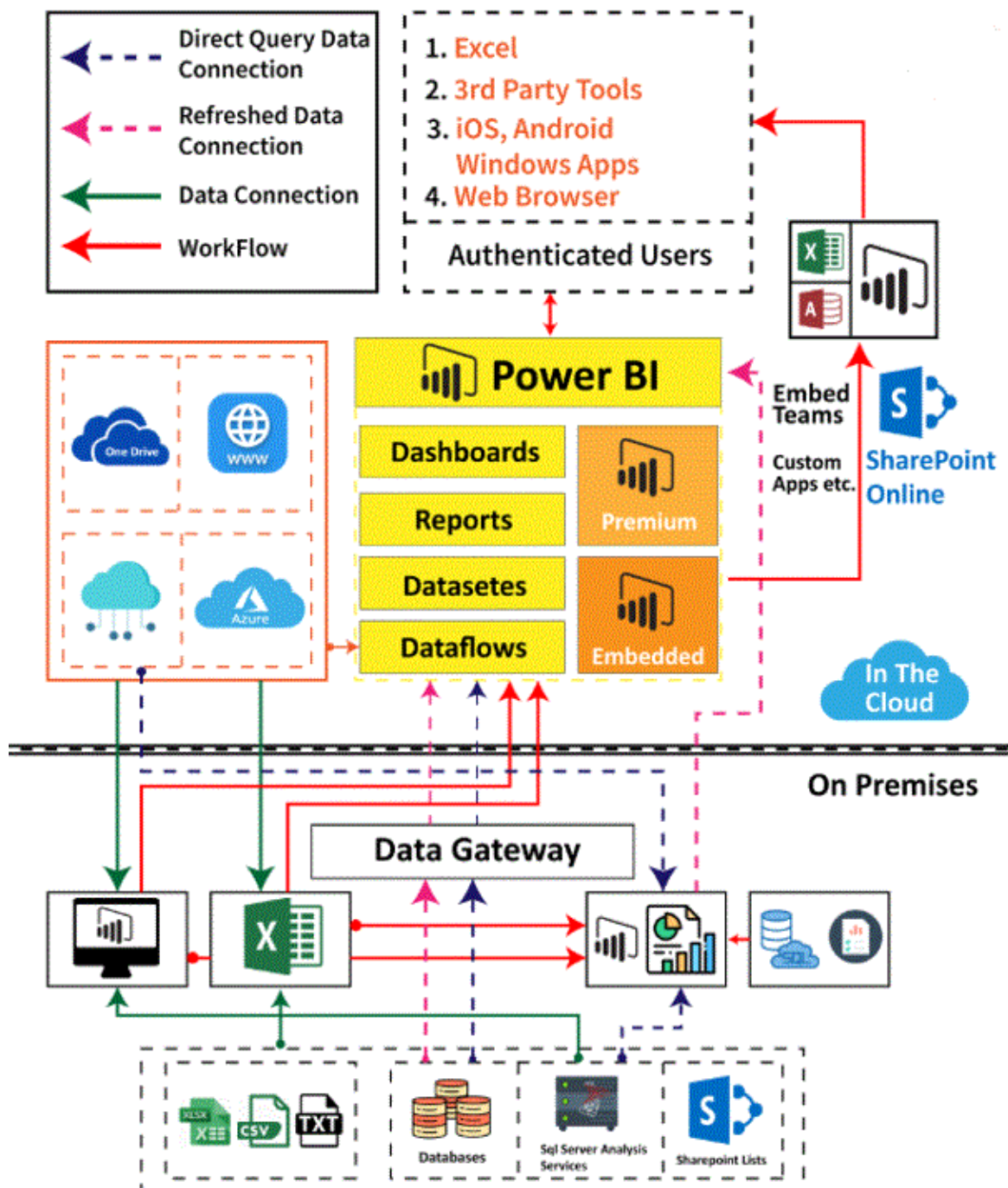
4.12 CPMS BI DATA MODEL

As CPMS creates a huge amount of data, logging all of your work processes and other production related information, this data container will become of high value for next step analysis and AI initiatives to optimize performance, efficiency, and quality.

CPMS can be delivered with an on-premises optimized and preconfigured BI data warehouse for firsthand analytics.

Additionally, Contec can integrate direct connections to enterprise data lakes for central data analysis, site comparisons and AI improvement processes.

Working of Power BI Architecture

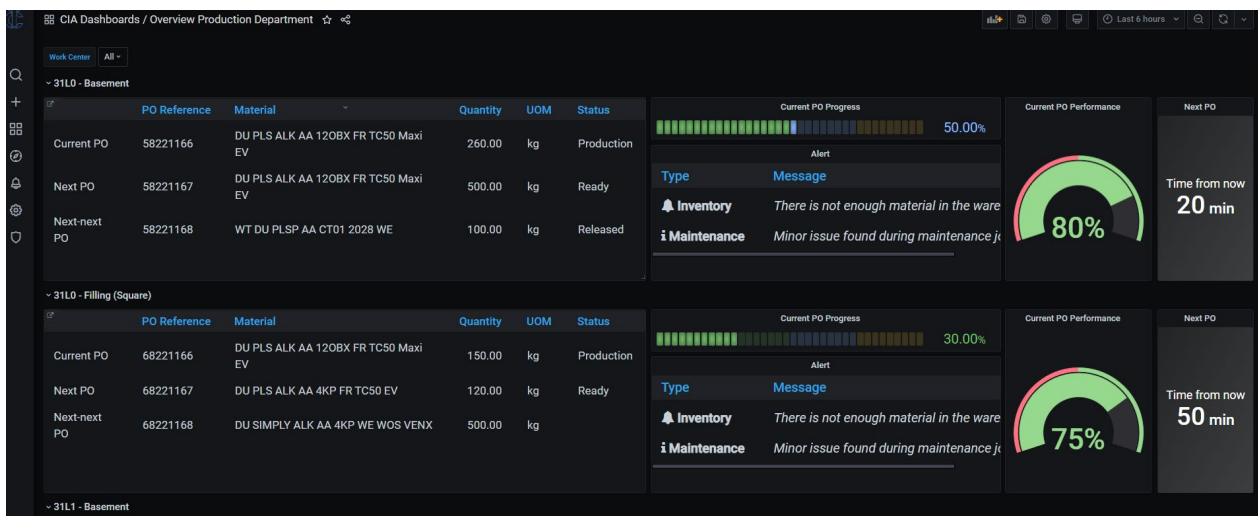
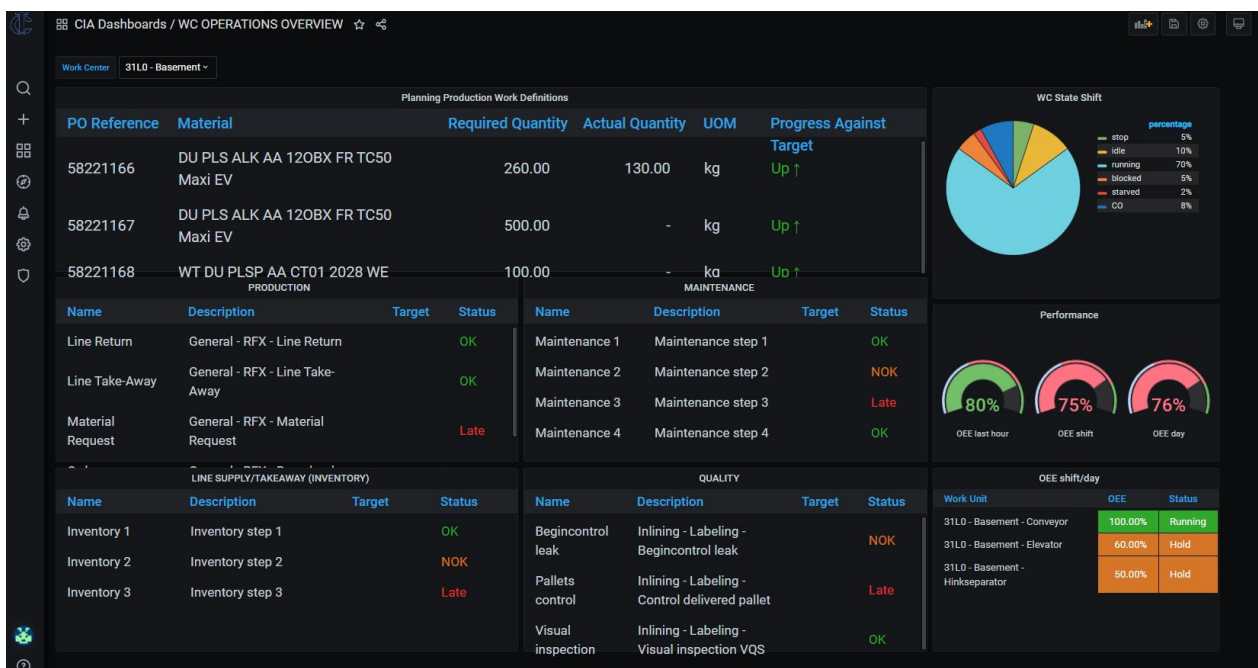


4.13 REAL-TIME DASHBOARDING LAYER

Dashboarding is implemented dependent on project specific requirements. When no dashboarding technology is available, open source, yet performant tools like Grafana Labs can be used as a presentation layer. Dashboard data views can be delivered within CPMS to allow customers to build their own dashboards and information panels.

Some dashboard samples can be:

- › Department overview of all work center status
- › Work center operation overview
- › OEE work center dashboard
- › KPI and internal logistic supply/takeway dashboards
- › Others



4.14 OTHER CPMS FEATURES

4.14.1 USE OF MOBILE SCANNER DEVICES

The operator interface can easily be optimized for mobile or small resolution devices, like scanners, RFID readers, mobile warehouse terminals etc... This allows the operator to perform the same actions on devices like the Zebra TC20 as he or she would be doing on their workstation computer.



4.14.2 USE OF WEARABLES

Contec can integrate wearables within their solutions to supply specific functional requirements. Smart watches can be used to fulfill specific tasks where minimum UI and interaction is required or operators have no possibility to use mobiles or screens (field terminal operators). Possible functional integration can be:

- › Operation area progress/KPI information
- › Alerting of alarms, malfunctioning or missed milestone work process targets.
- › Handling of specific operations like: • Start/stop loading trucks with material QTY follow up
- › Verification of process statuses



4.14.3 THIRD PARTY EQUIPMENT INTEGRATION

Contec has strong knowledge to integrate any kind of technology or equipment by use existing communication protocols and toolkits. In case no standards available, we write our own custom specific tools to fully integrate required needs within the platform.

4.14.4 HISTORIAN INTEGRATION

By connecting CPMS to an existing historian or by implementing a historian during CPMS integration, insights into operations related data can be further increased.

FEATURE MAPPING LIST

AGAINST MARKET SEGMENT REQUIREMENTS

TOPICS	FEATURES	PRODUCTION MARKETS				OPERATION SEGMENTS					
		F&B - CPG	DISCRETE MANUFACTURING	TANK TERMINALS	LIFE SCIENCES	BATCH INTEGRATION	INTERNAL LOGISTIC	PACKING AUTOMATION	QUALITY INTEGRATION	LEAN MANUFACTURING	
CONNECTIVITY	TABLET/MOBILE DEVICES	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	USER EXPERIENCE: ONE SINGLE EASY TO USE INTERFACE	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	3RD PARTY INTERFACING	✓	✓	✓	✓	✓	✓	✓	✓		
	ERP INTERFACE	✓	✓	✓	✓	✓	✓	✓	✓	✓	
PLANNING AND SCHEDULING	BASIC SCHEDULING	✓	✓	✓	✓	✓	✓	✓	✓		
	ADVANCED PLANNING AND SCHEDULING	✓	✓	✓	✓	✓	✓	✓	✓	✓	
PAPERLESS MANUFACTURING	ECIL	✓	✓	✓	✓	✓				✓	
	T&T RAW MATERIAL RECEPTION	✓	✓	✓	✓	✓	✓	✓			
	T&T LOT MANAGEMENT	✓	✓	✓	✓	✓	✓	✓			
	T&T MANUAL DOSING REGISTRATION	✓		✓	✓	✓	✓	✓			
	T&T PRODUCT SHIPMENT	✓	✓	✓	✓	✓	✓	✓			
	GMP/BOS	✓	✓	✓	✓					✓	
	KAIZEN	✓	✓	✓	✓					✓	
	AUTONOMOUS MAINTENANCE	✓	✓	✓	✓					✓	
	INCIDENT TRACKING	✓	✓	✓	✓	✓	✓	✓		✓	
	DAILY MANAGEMENT MEETING DASHBOARD	✓	✓	✓	✓					✓	
	OPERATOR GUIDANCE	WORKFLOW	✓	✓	✓	✓	✓	✓	✓	✓	✓
		INSTRUCTION BASE MANUFACTURING	✓	✓	✓	✓	✓	✓	✓	✓	✓
		IN LINE QUALITY CONTROL	✓	✓		✓				✓	✓
WHEIGING & DISPENSING		✓			✓	✓	✓				
MOM EXECUTION	FT BATCH INTERFACE	✓		✓	✓	✓					
	RAW MATERIAL IDENTIFICATION & LABELING	✓	✓		✓	✓	✓	✓			
	WIP TRACKING & IDENTIFICATION	✓	✓		✓	✓	✓	✓		✓	
	FINAL GOODS REGISTRATION (E.G. PALLET & BOX LABELING)	✓	✓		✓	✓	✓	✓			
EFFICIENCY	OEE	✓	✓		✓	✓		✓		✓	
	ENERGY CONSUMPTION/MANAGEMENT	✓	✓	✓	✓	✓		✓		✓	
QUALITY MANAGEMENT	PRODUCT DEFINITION MANAGEMENT: RECIPE MANAGEMENT BOM	✓	✓	✓	✓	✓	✓	✓	✓		
	PRODUCT DEFINITION MANAGEMENT: RECIPE MANAGEMENT BOO	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	PRODUCT DEFINITION MANAGEMENT: RECIPE MANAGEMENT BOP	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	IN LINE TESTING: QA TEST	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	CLASSIC REPORTING: PRODUCTION	✓	✓	✓	✓	✓	✓	✓	✓	✓	
REALTIME INSIGHTS	BIG DATA ANALYSIS AND VISUALS	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	SMART SENSOR	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	CLASSIC REPORTING: QUALITY	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	CLASSIC REPORTING: MAINTENANCE	✓	✓	✓	✓	✓	✓	✓	✓	✓	

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