DOCUMENT TITLE:

SMART FACTORY SOLUTIONS

FROM CROATIA

Project: Improving RD and business policy conditions for transnational cooperation in the manufacturing industry

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PU	Public	X
PP	Restricted to other Programme participants	
RE	Restricted to a group specified by the consortium	
CO	Confidential, only for members of the consortium	

Contents

1 IoT Digital Transformation in Production Process

Smart Factory solution provider profile

Organization:

> **X-LOGIC d.o.o.**
> Duzice 12, HR-10000 Zagreb
> Croatia

Website and social media:

> Website: www.x-logic.net
> Social media (Facebook): https://bit.ly/2ufIkWd
> Social media (Twitter): https://twitter.com/iot_xlogic
> Social media (LinkedIn): https://bit.ly/2u3WWsA

Contact details:

> Zdenko Marincic
> Tel. +385 98 733391
> E-mail: zdenko.marincic@x-logic.net

Type of organization:

> SME

Market sectors:

> Electrical and electronic engineering industries

Services provided:

> Engineering
> Research and development

Smart Factory solution

IoT Digital Transformation in Production Process

Product/Solution webpage:

> www.x-logic.net/digital.php

Type of solution:

> Product

Smart Factory description:

IoT Digital Transformation in Production Process is intended for automation and optimization of

production process. It consists of HW and SW part. HW part refers to CPU with communication module which receives and aggregates data from various industry sensors via wireless communication in each stage of production process and transfers this data to server. SW part consists of database and server application for monitoring and visualization.

IoT Digital Transformation in Production Process solution is introducing new technology with intension to help production companies to improve its production process and optimize cost. It automates the whole production process with latest state-of-art technology.

Figure 1: CPU with communication module

Figure 2: Software for monitoring and visualization

Keywords:

Internet of Things
Digital Transformation
Production management
PaaS

Example of Product/Service usage:

IoT Digital Transformation in Production Process is applicable to any production process in industry where monitoring of certain parameters is essential in every stage of the process. In our case X-LOGIC's IoT Digital Transformation is used in production of power transformers.

Improvement areas covered by the Product/Solution:

Increased speed of production operations
Decreased manufacturing costs
Improved information for production decisions
Improved agility and responsiveness in the production process
Improved information for business analytics
Improved remote monitoring capabilities
Developed visualization capabilities

Product/Solution is related to the following type of implementation:

Implementation of the novel technology
Implementation in the production processes

Other relevant information about the product/service:

Attachment1: Company logo
Attachment 2: IoT Digital Transformation in Production Process presentation

Product/service technological focus:

Electronic circuits, components and equipment
Electronics, Microelectronics
Information Processing & Systems, Workflow
IT and Telematics Applications
Process control and logistics

Market availability:

Available on market since May 2018

2 BusinessQ

Smart Factory solution provider profile

Organization:

Qualia poslovna rješenja d.o.o.
Ilica 144, 10000 Zagreb
Croatia

Website and social media:

Website: www.qualiadatasciences.com
Social media (Twitter): https://twitter.com/qualiahr
Social media (LinkedIn): https://www.linkedin.com/company/qualia-d-o-o-/

Contact details:

Hrvoje Smolić, CEO,
Mobile: +385 (91) 2010075
Email: hrvoje.smolic@qualia.hr

Type of organization:

SME

Market sectors:

Biotechnology
Chemicals
Digital economy
Electrical and electronic engineering industries
Food industry
Maritime industries
Textiles
Fashion and creative industries
Retail

Services provided:

Consulting,
Research and development,
Services (business intelligence, data science, machine learning, data visualization, blockchain, IIoT)

Smart Factory solution

BusinessQ

Product/Solution webpage:
www.businessq-software.com

Type of solution:
Product/solution

Smart Factory description:
Qualia BusinessQ is a business intelligence, data visualization and data discovery software.

With our partners we are building a comprehensive IT solution for the customers - Manufacturing Intelligence, in accordance with its needs and requirements. Such a solution belongs to the "Smart factory" category and refers to the domain we call Industry 4.0.

We design and IT solutions for collecting, managing, analyzing, displaying, and reporting industrial data within the BusinessQ software. Data is collected from different sources and from different industrial levels: individual machines, process lines, drives and business levels. The collection process can be local within a factory or remote with multiple geographic positions.
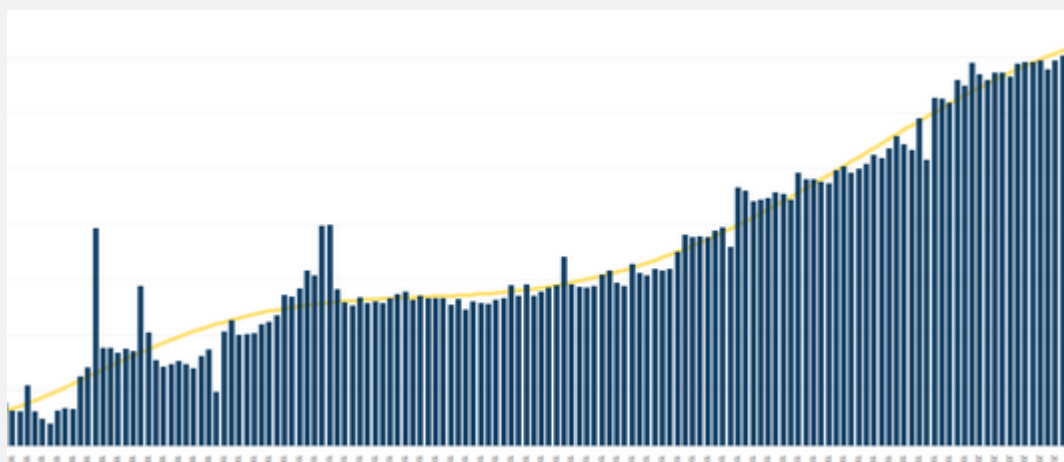
Figure 3: Analytical data of collected information

Our information-based solution based on analytical data processing supports visualization of information (Key Performance Indicators, Control Panel ...). Displaying and reporting is tailored to the responsibilities and obligations of employees in the system. From operator and technician in operation, process engineer, employee at business level to executive director. The goal is to provide every employee at their level of responsibility with timely information, anticipate and initiate the action that is expected of him.

The focus is on the use of collected data, with improvements in time utilization, performance and reliability in production.

Our Solution helps customers to efficiently manage production, raise product quality levels, and gain greater control of their operations.

Keywords:

Industry 4.0

IIoT

Smart Factory

business intelligence

data visualization

analytics

Operational visibility

Lean Manufacturing

Manufacturing execution system (MES)

Overall equipment effectiveness (OEE)

Key performance indicator (KPI)

Example of Product/Service usage:

Our solution and BusinessQ product can be implemented basically in any type of industry. First step is to ensure that all relevant data from machines is collected in the database. Next step is data optimisation and visualization in BusinessQ.
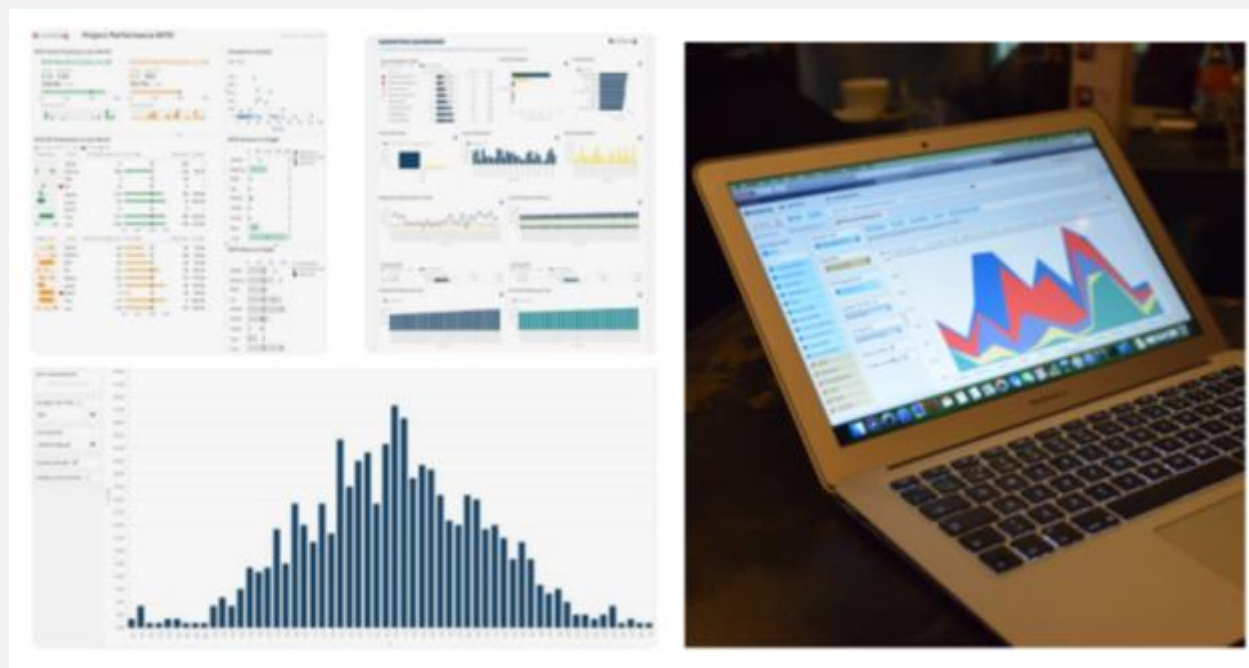

Figure 4: Statistical data

Improvement areas covered by the Product/Solution:

Increased speed of production operations

Decreased manufacturing costs

Lower energy costs

Improved information for production decisions

Improved agility and responsiveness in the production process

Improved maintenance/uptime

Improved information for business analytics

Improved remote monitoring capabilities

Developed visualization capabilities

Product/Solution is related to the following type of implementation:

Implementation of the novel technology

Other relevant information about the product/service:

Attachment1: BusinessQ overview

Attachment 2: BusinessQ architecture

Attachment 3: Logos

Attachment 4: additional materials: https://bit.ly/2KAiGGO

Product/service technological focus:

No focus, any industry is suitable for BusinessQ advanced industry analytics

Market availability:

BusinessQ software is available on the market since 2012

3 MECODES

Smart Factory solution provider profile

Organization:

> **CADCAM Group d.o.o.**
> Štoosova ulica 1, 10 000 Zagreb
> Croatia

Website and social media:

> Website: www.cadcam-group.eu
> Social media (Facebook): https://bit.ly/2NBxHWH
> Social media (LinkedIn): https://bit.ly/2N1rp1A

Contact details:

> Eva Doboš
> Tel. +385 95 503 5331
> E-mail: Eva.Dobos@cadcam-group.eu

Type of organization:

> SME

Market sectors:

> Aeronautics industries
> Automotive industry
> Defense industries
> Maritime industries
> Mechanical engineering

Services provided:

> Consulting
> Education/Training
> Engineering
> Research and development
> Services

Smart Factory solution

MECODES

Product/Solution webpage:

> http://www.mecodes.eu

Type of solution:

Product

Smart Factory description:

MECODES, developed by CADCAM Group is a unique software solution for collaboration throughout the entire electro-mechanical product development process.
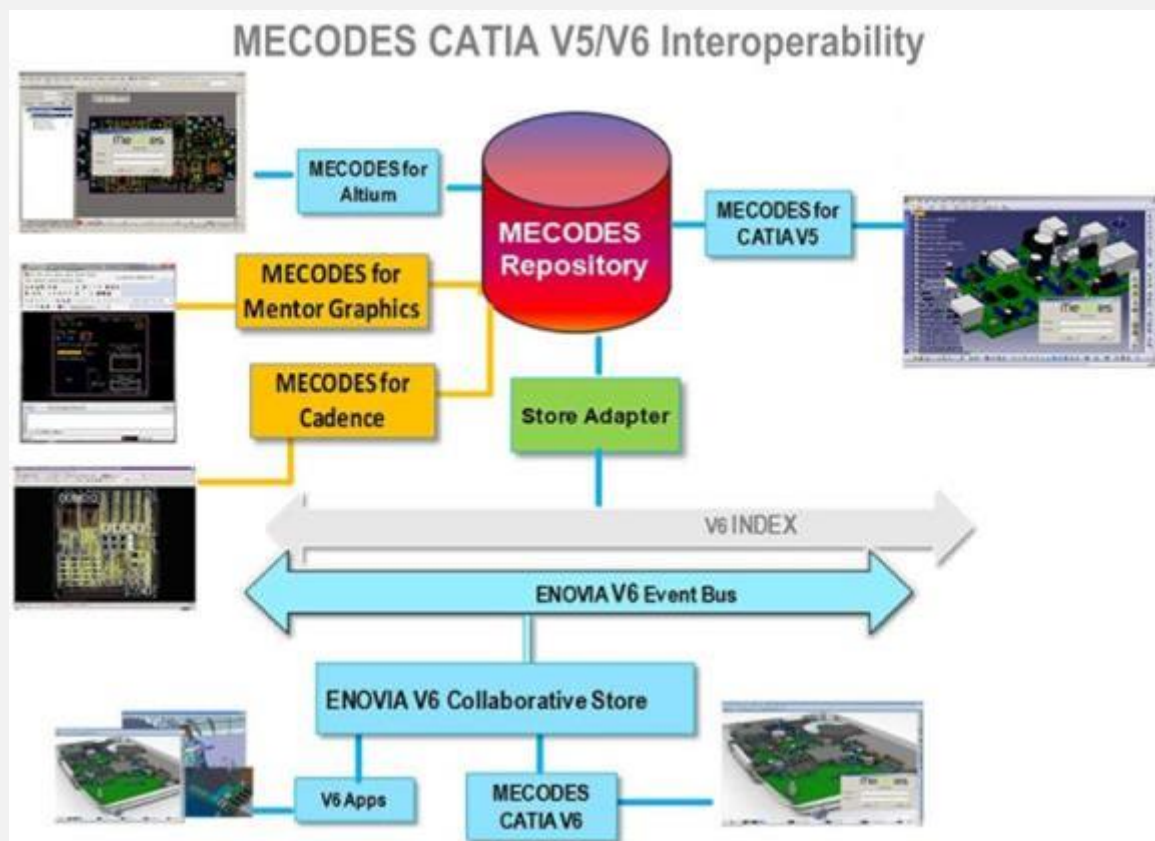
Figure 5: MECODES interoperability with various software

MECODES Collaboration Suits consist basically of two integrated subsystems which are essential for a successful collaboration: the Information Repository and the EDMD/IDF client for CATIA V5.

Table: MECODES Collaboration Suits subsystems

ECAD/MCAD Collaboration	Collaboration suite
The MECODES solution suite consists of: • MECODES EDMD for CATIA V5 and Mentor Graphics Expedition Enterprise and PADS collaboration	• MECODES Collaboration Suits consist basically of two integrated subsystems which are essential for a successful collaboration: The Information Repository and the EDMD/IDF client for CATIA V5

- created on the new recommendation EDMD (ProSTEP iViP Association). - MECODES for CATIA V5 and Altium V9 integration established on the IDF V3 industry standard and enhanced by customized XML schema. - MECODES CADENCE Multi-Layer import in CATIA V5 based on new IDF3++ standard	**PDM** - Project repositories with document management capabilities - Management of multiple revisions of the same unit of information (project documents, exchange documents

Design

MECODES replaces conventional design methodologies by multi-domain collaboration for Mechatronic. Addresses major challenges in cros domain designs:

- integration of the lifecycles from different domains
- integrated collaboration and communication to manage the dynamics of changes across mechatronic domains
- provide an integrated System preventing delays and increased cost of the final product design

| **Communication environment**	**Common library**
- Environment enhanced with messaging capabilities - Chat & voice enabled workspace - User presence detection system - Messaging client with file transfer capabilities	- Common library with custom specific components - Integrated library management tool with 2D/3D component view - MECODES include more than 2000 3D electronical library components
Mechatronic BOM	**Floating license**
- Complete BOM with mechanical and electrical components and parts ready for further processing	- Optimal license usage - License locked in MECODES environment - User administration tool
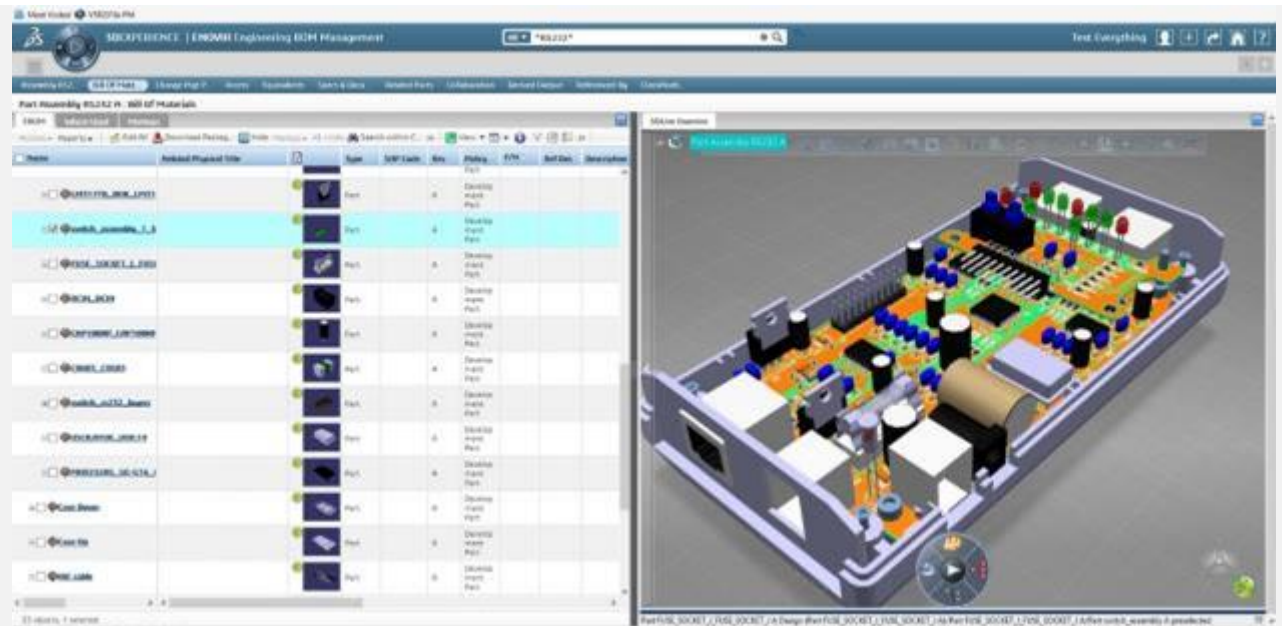
Figure 6: Mecodes on the 3DEXPERIENCE platform

Keywords:

      Collaboration

      Electro-mechanical product

      Development

Example of Product/Service usage:

      Improved design quality, faster development processes and reduced rework by collaboration

      Optimized and shortened development cycles by integration

      Increased product and process innovation through communication

      Advanced product analysis of cross-discipline results by 3D product representations

      Decreased time-to-market by resolving hurdles through communication within the entire product development process

      Accelerated return-on-investment by the faster introduction of new products to the marketplace

Improvement areas covered by the Product/Solution:

      Implementation of the novel technology

Product/Solution is related to the following type of implementation:

      Increased speed of production operations

      Decreased manufacturing costs

      Improved information for production decisions

      Improved agility and responsiveness in the production process

      Improved product quality

      Improved coordination with customers

Other relevant information about the product/service:
Attachment 1: MECODES logo
Attachment 2: MECODES presentation
Attachment 4: MECODES video (https://bit.ly/2zoQ4v2)

Product/service technological focus:
Aerospace Technology
Design and Modelling / Prototypes

Market availability:
Available on the market since 2012.

4 Web*ERPINS

Smart Factory solution provider profile

Organization:

ININ informaticki inzenjering d.o.o.
Dr. Mile Budaka 1
35000 Slavonski Brod
Croatia

Website and social media:

Website: www.inin.hr
Social media (LinkedIn): https://bit.ly/2IYFytP

Contact details:

Igor Majdandžić
Tel: +385 35 40 50 60
Email: inin@inin.hr

Type of organization:

SME

Market sectors:

Automotive industry
Chemicals
Construction
Digital economy
Electrical and electronic engineering industries
Mechanical engineering

Services provided:

OTHER: ERP solution for production companies with focus on planning/scheduling/monitoring/managing/automation

Smart Factory solution

Product/Solution webpage:

https://bit.ly/2NBxZNh

Type of solution:

Product

Smart Factory description:

Web*ERPINS is a modern business information system intended for managing business processes and traceability from inquiries for a service or a product to production resource assurance, initiating and monitoring the production process, quality assurance and product delivery. Many built-in functionalities significantly facilitate the everyday process of creating and tracking daily activities, and timely reporting.

Figure 7: web*ERPINS

Keywords:

> ERP system
> Software for manufacturing
> Planning and Scheduling
> Warehouse management system
> Tasks and documents integration and management

Example of Product/Service usage:

The system is primarily intended for production and service companies that need to automate and integrate business processes, and efficiently manage business resources while generating the required supporting documents. In accordance with specific demands for various types, there are options for metal, electrical, chemical, casting and woodworking production, and service activities.

Improvement areas covered by the Product/Solution:
Implementation in the production process

Product/Solution is related to the following type of implementation:
Improved coordination with suppliers
Increased speed of production operations
Decreased manufacturing costs
Improved information for production decisions
Improved agility and responsiveness in the production process
Improved product quality
Improved coordination with customers
Improved compliance with customer specs or regulatory requirements
Improved information for business analytics
Improved remote monitoring capabilities
Developed visualization capabilities

Other relevant information about the product/service:
Attachment 1: Company logo
Attachment 2: Short presentation

Product/service technological focus:
Industrial manufacturing
Process control and logistics

Market availability:
Available on the market

5 Decentralised indoor climate systems

Smart Factory solution provider profile

Organization:

Hoval d.o.o.
Puškarićeva 11E
10 250 Lučko, Croatia

Website and social media:

Website: www.hoval.hr
Social media (Facebook): https://bit.ly/2NBypmP
Social media (LinkedIn): https://bit.ly/2KRpgYK
Social media (YouTube): https://bit.ly/2u3Zg2M

Contact details:

Phone**:** +385 1 4666 376
E-mail: hoval.hr@hoval.com

Type of organization:

SME

Market sectors:

Construction
Electrical and electronic engineering industries
Mechanical engineering
Pressure equipment and gas appliances

Services provided:

Consulting
Education/Training
Engineering
Services

Smart Factory solution

Decentralised indoor climate systems

Product/Solution webpage:
> www.hoval.hr
> https://bit.ly/2B5KoBW

Type of solution:
> Product

Smart Factory description:
The key part of any planning process is the right selection of the ventilation system, no matter if we talk about the renovations or the new buildings. **Hoval indoor climate systems** are flexible, efficient and comfortable. They create an ideal climate and ensure a good air quality in large spaces, while minimising energy consumption. Unlike centralised systems, **decentralised** ones **have a modular structure** in which one system contains multiple and possibly different indoor climate units. Therefore, **maximum adaptability and flexibility** is ensured in all phases: from planning, installation, operation to maintenance.

Figure 8: Decentralised system solution (source: Hoval)

The indoor climate systems are installed on the ceiling or in the roof, distributed throughout the interior. They inject **enough amount of fresh and clean air** into the interior from above using the patented vortex air distributor. In addition, the occupied area is thoroughly ventilated without unpleasant draughts, which boosts the employee productivity. Also, the system is **duct-free** which offers many advantages in terms of space requirements, hygiene and efficiency.

Figure 9: RoofVent® RH roof unit (source: Hoval)

Figure 10: TopVent® DKV unit

Hoval decentralised systems are masters in **energy saving** thanks to their patented vortex air distributor, called Air-Injector. Compared to the other systems, it requires 25-30% smaller air flow rate to achieve the desired conditions, which **reduces operating costs**. Plus, temperature stratification is reduced, which means less heat loss through the roof.

Specifically developed **control and regulation** for Hoval indoor climate systems reliably ensures achieving the full potential of decentralised units and optimal use of resources, while keeping operating costs low.

Some of the main advantages are:
- Adaptable, zone-based control concept
- The userfriendly Plug&Play principle of the units;
- Simple and rapid commissioning;
- Automatically controlled and optimal air distribution thanks to Air-Injector;
- Optimal energy utilization and cost-efficient operation.

Keywords:
> Decentralised system
> Ventilation units
> Indoor climate systems
> Ideal climate
> Energy saving

Example of Product/Service usage:
Pannonian wood competence centre in Virovitica, known as **the heart of Croatian timber and wood-processing industry**, is one of the most significant EU projects of Virovitica-Podravina County. The centre is built on the principles of Green Buildings and it ensures perfect working conditions and comfortable indoor climate thanks to the installed Hoval decentralised units.

On the top of the plant-covered roof are placed **two RoofVent® roof ventilation units**, which blend perfectly into the surroundings and give added value to the whole "green" story.

Figure 11: RoofVent RH units on the green roof
(source: Pannonian wood competence centre gallery)

Inside the centre are installed **two TopVent® recirculation air units** which are mounted on the ceiling. They guarantee that in the production hall is always plenty fresh air, good climate and working conditions. Also, the whole system is duct-free, so it fits perfectly in the infrastructure as there are no ventilation ducts which would interfere in the production work.

Thanks to the complete **Hoval decentralised system**, Pannonian wood competence centre achieves the highest energy efficiency, operating costs reduction, while simultaneously having a good impact on the environment. Even though the installed system is barely noticeable, there is always constant supply of fresh air, ideal temperature and climate conditions in the hall, without unpleasant draughts. Finally, the overall system enables easy maintenance and control which gives added value to the investor.

Figure 12: TopVent DHV unit inside the hall
(source: Pannonian wood competence centre gallery)

Improvement areas covered by the Product/Solution:

Lower energy costs

Improved compliance with customer specs or regulatory requirements

Improved maintenance/uptime

Improved information for business analytics

Improved remote monitoring capabilities

Improved safety

Product/Solution is related to the following type of implementation:

Implementation of the novel technology

Other relevant information about the product/service:

Attachment 1: Company logo

Attachment 2: Product presentation

Attachment 3: Video about Air Injector (https://bit.ly/2KYyijj)

Attachment 4: Video about industrial ventilation systems
(https://bit.ly/2KQdj5N)

Product/service technological focus:

Carbon capture and energy

Energy efficiency

Other Industrial Technologies

Environment

Safety

Market availability:

Available on the market since 2015

6 Smart High-Speed Motorized Spindle

Smart Factory solution provider profile

Organization:

HSTEC d.d.
Zagrebačka ulica 100
23000 Zadar, Croatia

Website and social media:

Website: www.hstec.hr
Social media (LinkedIn): https://bit.ly/2zoXGh2

Contact details:

Tel. +385 23 205 405
Fax. +385 23 205 406
E-mail: info@hstec.hr

Type of organization:

SME

Market sectors:

Automotive industry
Electrical and electronic engineering industries
Mechanical engineering

Services provided:

Engineering
Manufacturing
Research and development
Services

Smart Factory solution

Smart High-Speed Motorized Spindle

Product/Solution webpage:

www.hstec.hr

Type of solution:

Product

Smart Factory description:

HSTec is an innovative development and production company with many years of experience in the field of high-speed motorized spindles, industrial automation and robotics.

The concept of product development is based on the principles of open innovation and special prototype production. Of great importance are the continuous improvement and adoption of new technologies and the collaboration with scientific research institutions.

The founding of the company in 1997 was realized in cooperation with the German company Bosch-Rexroth (formerly INDRAMAT), a world-renowned company in the production of electric motor drives and the company SAS Zadar known for the production of special machine tools and systems.

HSTec offers a wide range of customized motorized spindles, direct driven units, special machine tools and assembly machines, as well as the implementation of robotic cells for various applications.

A flexible team of leading mechanical and electrical engineers continually launches new product development and offers creative and comprehensive solutions in the field of industrial automation.

In addition to the core business activities, development and manufacturing of innovative products, HSTec has become the regional market leader in service, repairs and optimization of motorized spindles.

HSTec especially emphasizes its orientation to the needs and satisfaction of its customers, the introduction of new technologies and the achievement of the highest standard of professionalism in project performance and documentation, and the expansion to the new markets and the creation of new products and services. The company applies and continually improves the efficiency of a quality management system in accordance with the requirements of the international standard ISO 9001: 2015. The quality of the managerial activities, the more efficient connectivity between the departments, as well as the business process control are all achieved through the ERP-PLM business information system.

The long-term vision is to contribute to the development of the new concept - Industry 4.0 on a global scale, which aims to create smart products and factories by integrating ICT technology and digitizing different sensor systems as a path to improving the quality and efficiency of production processes.

HSTec's development team of mechanical and electrical engineers offers custom made solutions, advises the customer, improves and automates existing manufacturing processes in various industries. Our strengths are our expertise and know-how and we are proud to be a part of the new concept of developing intelligent and networked systems by creating smart products. Integration of sensor technology, ICT technology, electronic data loggers and vision systems into our products gives us the benefit of developing highly technological and innovative drive systems, custom made assembly machines, machine tools, and robotic cells.
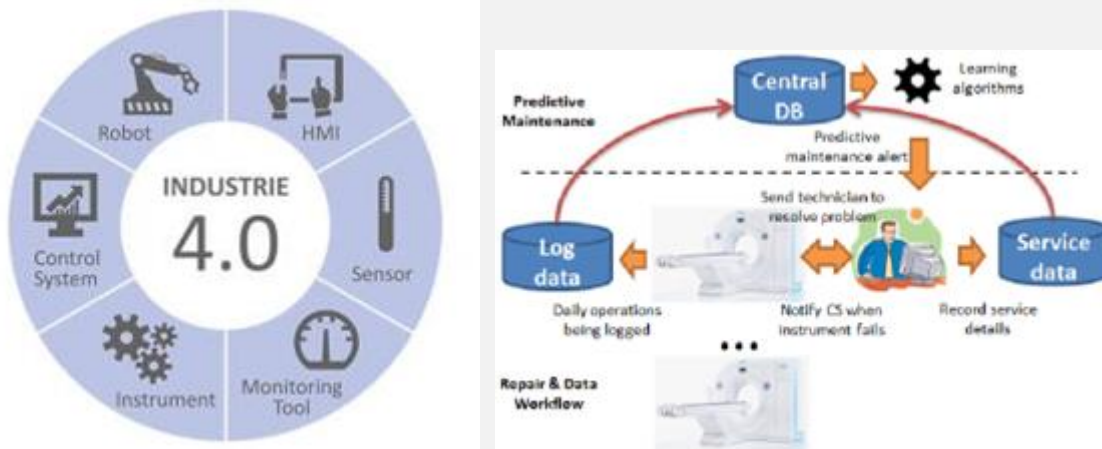
Figure 13: Smart High-Speed Motorized Spindle scheme

One of the product example is a machine tool component - the motorized spindle. Motorized spindles are the rotating axes of the machines and represent the main machining component. With integration of various adequate sensors and data logger inside of the spindle, the spindle becomes a smart product with ability to collect all the relevant data and parameters of the machining process, as well as to connect and to communicate to other machines. This is especially important at establishing the machine network in a manufacturing process and at predictive machine maintenance.

Keywords:
> smart products
> sensor and ICT technology
> electronic data loggers
> machine tool component
> high-speed motorized spindle

Example of Product/Service usage:
The smart high-speed motorized spindle is used in a machine tool for various machining applications, such as: grinding, turning, boring. The machining process data are collected via various sensors, after which the data are analyzed in real time and stored in internal memory. The spindle can be connected to the main server or to other machines and is able to communicate and send alarm or error reports. It is possible to track the spindle temperature, vibration and speed in real time, enabling the user to monitor the errors, alarms, mechanical condition of the machine and predictive maintenance of the machine.

The smart high-speed motorized spindle is ready to be used in Smart factories and can provide following characteristics connected to the concept Industry 4.0: self-awareness, self-predictiveness, self-maintenance and self-organization.

Figure 14: Smart high-speed motorized spindle

Improvement areas covered by the Product/Solution:
> Increased speed of production operations
> Decreased manufacturing costs
> Lower energy costs
> Improved information for production decisions
> Improved agility and responsiveness in the production process
> Improved product quality
> Improved maintenance/uptime
> Improved information for business analytics
> Improved remote monitoring capabilities
> Improved safety

Product/Solution is related to the following type of implementation:
> Implementation in the production processes

Other relevant information about the product/service:
> Attachment1: Company LOGO
> Attachment 2: Company and products presentation

Product/service technological focus:
> Design and Modelling / Prototypes
> Industrial Manufacture

Market availability:
> Available on the market since 2010

7 Smart Sense Air Quality Monitoring Solution

Smart Factory solution provider profile

Organization:

Smart Sense d.o.o.
Zagrebačka cesta 145a, 10000 Zagreb
Croatia

Website and social media:

Website: www.smart-sense.hr
Social media (Facebook): https://bit.ly/2J5cdOD
Social media (LinkedIn): https://bit.ly/2zntG5d

Contact details:

Hana Matanović
Tel: +385 1 5584 284
E-mail: info@smart-sense.hr

Type of organization:

SME

Market sectors:

Electrical and electronic engineering industries
Telecom and ISP providers

Services provided:

Research and development
Engineering
Manufacturing

Smart Factory solution

Smart Sense Air Quality Monitoring Solution

Product/Solution webpage:

www.smart-sense.hr

Type of solution:

Product
Service

Smart Factory description:

Exposure to air pollution can have long term negative health effects. The first step we can do is

to raise awareness about it by measuring the pollutants.

Smart Sense developed affordable but again precise **Air quality monitoring solution** which will help users to collect air quality data in real time and therefore be able to analyze it and correlate with other parameters. This enables them to monitor air quality locally and on location where it is critical and according to data take actions. **Smart Sense brings value** to **Cities**, especially the ones who wants to be smart cities, **citizens** who wants to be informed about the air they are breathing, to **environmental and health agencies** who can collect indicative measurements and according to them make models and predict air quality, to **telecoms and corporations** who can bring a new service on the market and within smart city initiative enrich their portfolio. Our mission is to help relevant institutions around the world to reduce air pollution and improve human health, environment and climate.

Basic concept of our solution is that we took the functionality of a professional monitoring station and put it in a smaller package, added connectivity and made everything much smaller thus affordable. Small, flexible, modular, affordable and easy to deploy monitoring stations produce indicative **measurements** which are **validated by Teaching Institute of Public Health in Croatia**. We measure temperature, humidity, air pressure, 5 types of gases (using electrochemical gas modules) and 3 types of particles. Station can be extended with additional gas sensors, noise, and wind and rainfall sensor. Our own developed IoT platform and WEB application which we use for visualization and presentation of collected data can integrate with any other IoT platform (e.g. Nokia Impact, Cisco Kinetic). Solution is flexible to adjust to specific end customer requirements.

The illustration shows the basic concept of the Smart Sense Air Quality system which is comprised of the measuring station and the Cloud and FrontEnd applications.
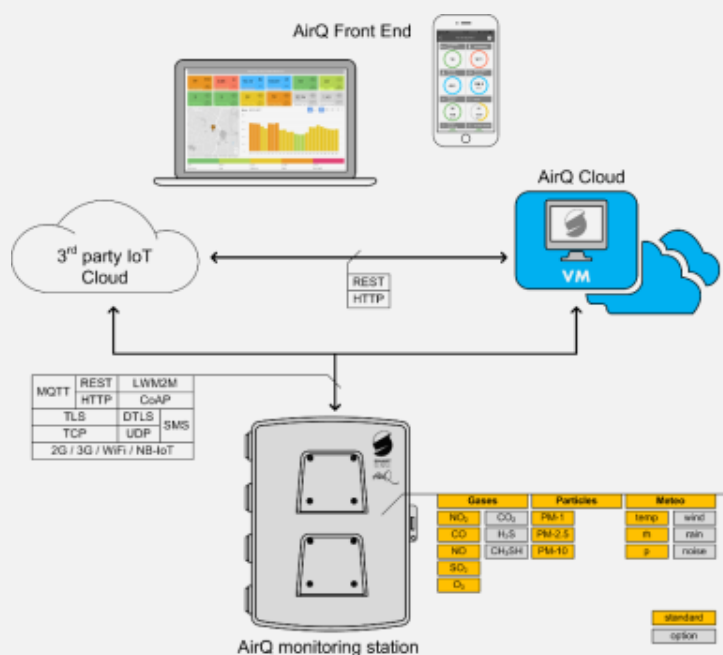

Figure 15: Illustration of Smart Sense Air Quality Monitoring Solution

Keywords:
Environmental monitoring
Air Quality
Internet of Things
Smart City

Example of Product/Service usage:
Some of potential use cases of **Smart Sense Air Quality Monitoring Solution:**
Big data - Data management by ecological and health agencies
Promotion - Promotion of the city as a tourist destination with high air quality
Noise detection - Air pollution is also measured by the present noise level
Emergency situations - Inform citizens precisely about air quality depending on their location – important in case of natural disasters (e.g. fire) and emergency situations

Figure 16: Use of Smart Sense Air Quality Monitoring Solution

Improvement areas covered by the Product/Solution:
Implementation of the novel technology

Product/Solution is related to the following type of implementation:
Improved remote monitoring capabilities
Developed visualization capabilities
Improved information for business analytics

Other relevant information about the product/service:
Attachment1: Company logo
Attachment 2: Solution presentation

Product/service technological focus:
Electronic circuits, components and equipment
Information Processing & Systems, Workflow
Environment

Safety

Market availability:

Available on the market since 2017

8 PROEL Factory Monitoring

Smart Factory solution provider profile

Organization:

Proton EL d.o.o.
Štefanovečka 10, 10040 Zagreb
Croatia

Website and social media:

Website: www.proel.hr
Social media (LinkedIn): https://bit.ly/2m5jXad

Contact details:

Andrija Puškaš
Tel. +385 91 234 0320
e-mail: andrija.puskas@proel.hr; info@proel.hr

Type of organization:

SME

Market sectors:

Electrical and electronic engineering industries

Services provided:

Engineering
Research and development

Smart Factory solution

PROEL Factory Monitoring

Product/Solution webpage:

https://bit.ly/2KUoSsG

Type of solution:

Product

Smart Factory description:

PROEL Factory Monitoring is the solution for monitoring and optimizing key processes in the manufacturing industry. This software/hardware solution is developed and planned for each client individually, since the need of each factory is different.

PROEL Factory Monitoring combines the modern IT solution technologies which utilize all the data from machine sensors (product counters, speed monitoring…), measuring devices

(electrical power measurements, water consumption, gas consumption, temperature…) and industrial cameras (for counting and quality control).

This solution provides real-time monitoring of energy consumption, machine productivity (KPI) and provides powerful production analysis tools for planning and production management. Wider application of this solution is used for smart building (hotels, sport facilities, buildings…)

This type of SaaS is the first step to complete factory monitoring and Industry 4.0.

Figure 17: PROEL Factory Monitoring solution

Keywords:

          Factory monitoring
          Power management
          SaaS
          KPI
          Production optimization

Example of Product/Service usage:

PROEL Factory Monitoring can be used to analyse the complete power network of the factory (in this case the data centre). System is design together with customer to provide the best functionality.

Figure 18: PROEL Factory Monitoring software

System can be used to track the production in real time. System features include:

        Energy consumption (electrical, gas…)

        Machine productivity (KPI, maintenance planning)

        Interface to business platforms (ERP)

        E-mail and SMS notifications and reports (PDF, CSV)

        Data security (system protection)

        Remote system access (web applications, mobile access…)

        On-line system modification (no need to stop the production to make system modifications)

        Data storage and backtracking of previous productions
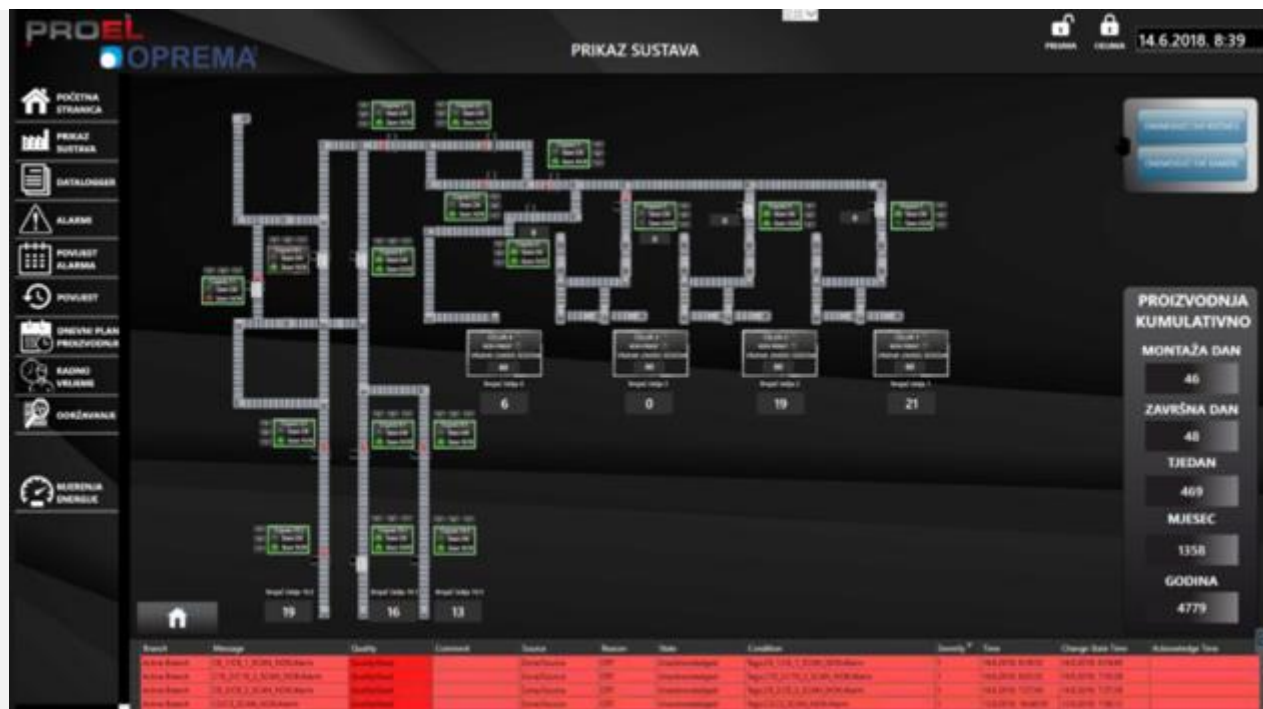
        Alarming tools

Figure 19: PROEL Factory Monitoring software

The solution can be implemented in the existing factories by using the client's existing IT and hardware infrastructure and/or adding new. This solution is suitable for all factories which use automatic machinery for material production and/or have high cost of energy resources and need a precise energy and production planning. Return of investment for factories is usually less than 12 months (project dependent).

Improvement areas covered by the Product/Solution:
      Increased speed of production operations
      Lower energy costs
      Improved agility and responsiveness in the production process
      Improved information for business analytics
      Developed visualization capabilities

Product/Solution is related to the following type of implementation:
      Implementation in the production processes

Other relevant information about the product/service:
      Attachment1: Company Logo
      Attachment 2: Product Presentation
      Attachment 3: Company Profile Presentation

Product/service technological focus:
      Information Processing & Systems, Workflow
      Energy efficiency

Industrial manufacturing

Market availability:

Available on the market since 2015

9 Smart Communications & IoT for Manufacturing

Smart Factory solution provider profile

Organization:

> **Micro-Link d.o.o.**
> Jaruščica 9a, 10000 Zagreb
> Croatia

Website and social media:

> Website: http://www.microlink.hr/
> Social media (LinkedIn): https://bit.ly/2NE1VYX

Contact details:

> Ivana Janković Šafarić
> Tel. +385 1 3636884
> E-mail: ivana.jankovic@microlink.hr

Type of organization:

> SME

Market sectors:

> Electrical and electronic engineering industries

Services provided:

> Consulting
> Education/Training
> Engineering
> Manufacturing
> Services

Smart Factory solution

Smart Communications & IoT for Manufacturing

Product/Solution webpage:

> http://www.microlink.hr/industrija.aspx

Type of solution:

> Product
> Service

Smart Factory description:

Micro-Link smart factory solution offering include the main 3 portfolio components:

1. **Private communications network for manufacturing**

    Production companies need an integrated communications platform to maximize workforce productivity, improve worker safety, and reduce downtime.

    For the needs of employee communication at the factory, a private mobile network (PMR) is being implemented, providing advanced features and ATEX certifications with secure and efficient communication and ultimately reducing the total cost of communication.

2. **Wi-Fi network in manufacturing plants and warehouses**

    Warehouses and production facilities, due to many metal obstacles such as warehouse gifts and large machines, challenge the quality coverage of Wi-Fi signals in all areas. Additional challenges also cause frequent changes in the space itself (such as current warehouse capacities or movable shelves), but also endless end-user orientation changes, whether they are barcode scanners or tablets.

    By implementing professional Wi-Fi solutions, we provide coverage for large production facilities and / or warehouses with the optimum number of access points to increase barcode efficiency or access the Internet through Wi-Fi.

3. **IoT (Internet of Things) applications in manufacturing**

    With the focus on process optimization and rationalization of maintenance costs, IIoT (Industrial IoT) applications open up unmatched possibilities in automation, smart manufacturing, tracking the position of goods and machines and their status or general conditions in the plants.

These solutions are fully customized, according to requirements of concrete client and their manufacturing plant, to achieve optimal communication and data transfer for automatization of the manufacturing process.

These three solutions components can be implemented as a full package, or applied fully independently, based on concrete situation in the factory and the challenges the customer is facing in the production process.

Keywords:

smart communications
smart manufacturing
digital radio technology
private mobile communications
unified communications
Wi-Fi
RFID
barcode scanners
IoT (Internet of Things)
IIoT (Industrial Internet of Things)

sensors

warehouse radio communications

Improvement areas covered by the Product/Solution:

Implementation of the novel technology

Implementation in the production processes

Product/Solution is related to the following type of implementation:

Increased speed of production operations

Decreased manufacturing costs

Lower energy costs

Improved information for production decisions

Improved agility and responsiveness in the production process

Improved product quality

Improved maintenance/uptime

Improved information for business analytics

Improved remote monitoring capabilities

Improved safety

Developed visualization capabilities

Product/service technological focus:

AGROFOOD INDUSTRY

- Food quality and safety
- Technologies for the food industry

INDUSTRIAL MANUFACTURING, MATERIAL AND TRANSPORT

- Aerospace Technology
- Construction Technology
- Design and Modelling / Prototypes
- Industrial Manufacture
- Materials Technology
- Packaging / Handling
- Plant Design and Maintenance
- Process control and logistics
- Traffic, mobility
- Transport and Shipping Technologies
- Transport Infrastructure

OTHER INDUSTRIAL TECHNOLOGIES

- Other Industrial Technologies

PROTECTING MAN AND ENVIRONMENT

- Environment
- Safety
- Waste Management
- Water Management

Market availability:

Available on the market

10 IZIT d.o.o.

Smart Factory solution provider profile

Organization:

IZIT d.o.o.
Fallerovo šetalište 22, HR-10000 Zagreb
Croatia

Website and social media:

Website: www.izit.hr
Social media (Facebook): https://bit.ly/2IZvS26
Social media (LinkedIn): https://bit.ly/2N0XEOi

Contact details:

Amir Šećerkadić
Tel. +385 99 60 44 987
E-mail: amir@izit.hr

Type of organization:

SME

Market sectors:

Aeronautics industries
Automotive industry
Digital economy
Electrical and electronic engineering industries
Food industry
Healthcare industries
Maritime industries
Mechanical engineering
Medical devices
Textiles
Fashion and creative industries

Services provided:

Consulting
Education/Training
Engineering
Manufacturing
Research and development
Services

Smart Factory solution

Product/Solution webpage:
> www.izit.hr

Type of solution:
> Product
> Service

Smart Factory description:

Offering both equipment and services in field of 3D modelling and 3D printing of plastic materials. We use the high-end machines of FDM and polyjet technology for 3D printing a wide range of different materials from ABS to high end thermoplastics.

Figure 20: 3D helmets

Keywords:
> 3D scanning
> 3D modeling
> Reverse Engineering
> 3D printing

Example of Product/Service usage:

Making the part its best takes more than just a machine. It takes a team of attentive experts behind the technology, working to validate processes and collaborate with you. Backed by our

production capabilities and decades in the industry, your project will be delivered to your requirements, on-time. Bring to life complex, detailed projects with an unparalleled design freedom. Move from a CAD design to a physical part in your hands and in front of your team quickly. Take advantage of faster lead times, reduced costs and a more efficient supply chain. Whether you're looking for assistance in making small changes on your CAD or need more robust design solutions for your application, we have expansive services to make your project successful. Create products that leverage the power of additive manufacturing. Our designers help optimize CAD models for functionality, appearance and value for use with our 3D printing technologies.
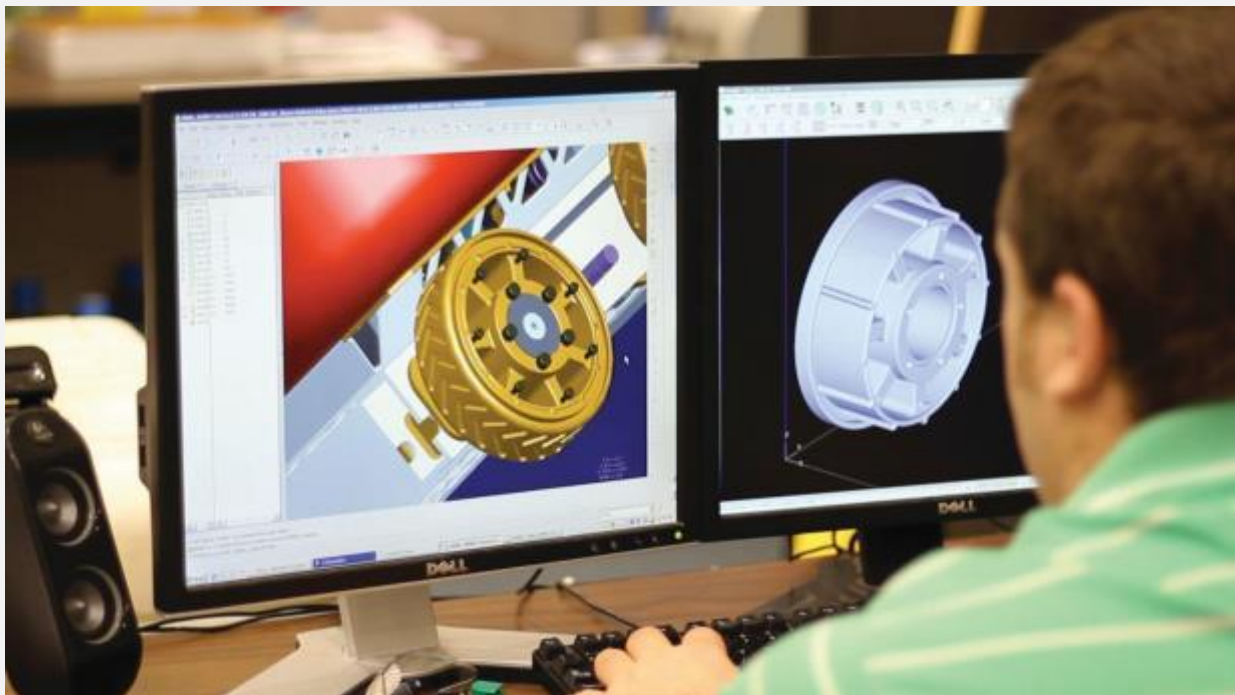

Figure 21: CAD models

Improvement areas covered by the Product/Solution:
>Implementation of the novel technology
>Implementation in the production processes

Product/Solution is related to the following type of implementation:
>Improved coordination with suppliers
>Increased speed of production operations
>Decreased manufacturing costs
>Lower energy costs
>Improved information for production decisions
>Improved agility and responsiveness in the production process
>Improved product quality
>Improved coordination with customers
>Improved compliance with customer specs or regulatory requirements

Improved maintenance/uptime

Improved safety

Developed visualization capabilities

Other relevant information about the product/service:

Attachment1: Company visual standard

Attachment 2: Company presentation

Product/service technological focus:

INDUSTRIAL MANUFACTURING, MATERIAL AND TRANSPORT

- Aerospace Technology
- Construction Technology
- Design and Modelling / Prototypes
- Industrial Manufacture
- Materials Technology
- Packaging / Handling
- Plant Design and Maintenance
- Process control and logistics
- Traffic, mobility
- Transport and Shipping Technologies
- Transport Infrastructure

OTHER INDUSTRIAL TECHNOLOGIES

- Other Industrial Technologies

SOCIAL AND ECONOMICS CONCERNS

- Citizens participation
- Creative products
- Creative services
- Education and Training

Market availability:

Various market availability

11 AIDA software suite

Smart Factory solution provider profile

Organization:
> **CODEL d.o.o.**
> Banatska 40, 10040 Zagreb
> Croatia

Website and social media:
> Website: www.codel.hr

Contact details:
> Marijan Sever
> Tel: +385 1 2003 770
> e-mail: marijan.sever@codel.hr

Type of organization:
> SME

Market sectors:
- Aeronautics industries
- Automotive industry
- Electrical and electronic engineering industries
- Food industry
- Healthcare industries
- Mechanical engineering

Services provided:
- Consulting
- Engineering
- Manufacturing
- Research and development
- Services

Smart Factory solution

AIDA software suite

Product/Solution webpage:
> www.codel.hr/aida

Type of solution:

Product

Smart Factory description:

AIDA is unique system that integrates industrial machines, production process and data transmission with ERP system like SAP or other.

AIDA concept is based on group of small, independent and interconnected modules that are design to manage different part of industrial processes like communications, data transmission, system monitoring, machine control and other. Architecture based on multiple in depended modules provide AIDA application to be easily modified and upgraded to meet customer requirements.

AIDA application is designed to provide solution that is based on detailed and full process analysis which results in defining optimal technical, technological and communication requirements integrated to provide fully functional tool.
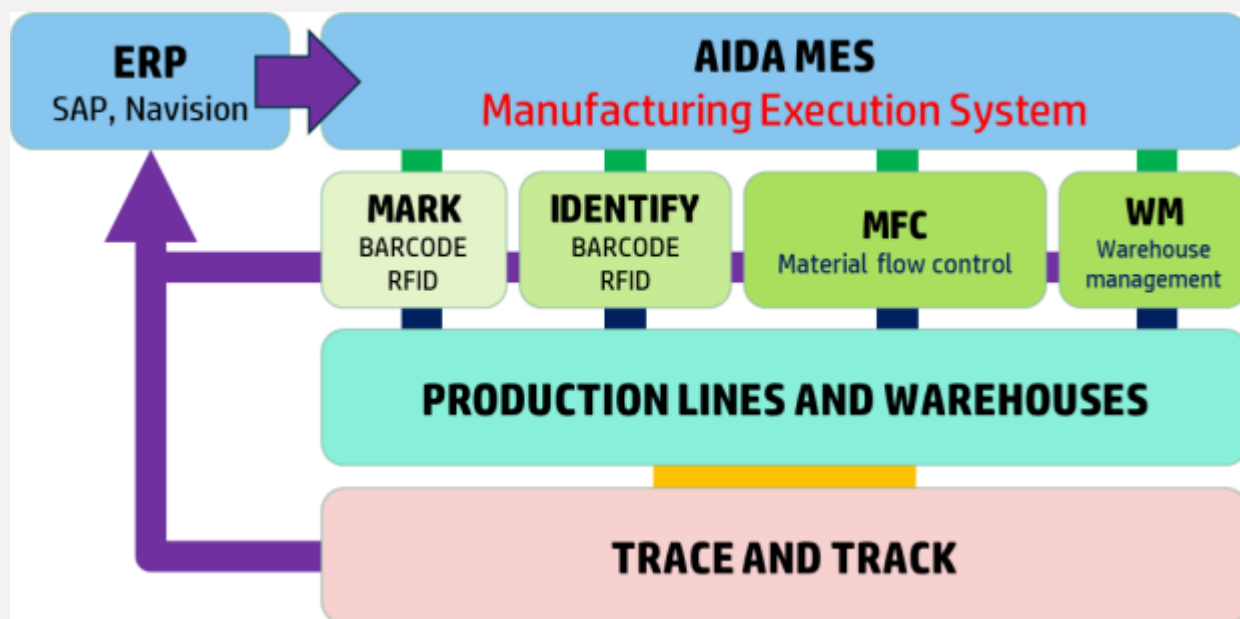

Figure 22: AIDA MES scheme

Although AIDA was originally designed for collection, processing and forwarding of data, during the application of the actual operating conditions, in AIDA were integrated modules with different functionality, so today AIDA consists of the following modules:

- AIDA-MES (AIDA Manufacture Execution Management)
- AIDA-MK (Marking module), Barcode printers and applicators
- AIDA-ID (Identification module)
- AIDA-TT (Trace and Track)
- AIDA-MFC (Material flow control)

- AIDA-WM (Warehouse management)

Keywords:
Vertical integration
SAP middleware
IDOC manager
Manufacturing Execution System
Real time serialization

Example of Product/Service usage:
AIDA is suitable for medium and big production plants for integration of industrial machines, production process and data transmission with ERP system like SAP or other, and also for for track and trace, as well as for quality management purposes.

Improvement areas covered by the Product/Solution:
Implementation of the novel technology
Implementation in the production processes

Product/Solution is related to the following type of implementation:
Improved coordination with suppliers
Increased speed of production operations
Decreased manufacturing costs
Improved information for production decisions
Improved agility and responsiveness in the production process
Improved product quality
Improved coordination with customers
Improved compliance with customer specs or regulatory requirements
Improved information for business analytics
Improved remote monitoring capabilities

Other relevant information about the product/service:
Attachment1: AIDA software suite presentation

Product/service technological focus:

Information Processing & Systems, Workflow
Industrial Manufacture
Packaging / Handling
Process control and logistics
Standards

Market availability:
Available on market

12 ThingWorx - Industry Innovation Platform

Smart Factory solution provider profile

Organization:

EAG Center Technologies d.o.o.
Oreškovićeva 6C, 10020 Zagreb
Croatia

Website and social media:

Website: www.eag.hr
Social media (Facebook): https://bit.ly/2m5UVYw

Contact details:

Sofija Burazin
Tel: +385 98 372 791
e-mail: sofija@eag.hr

Type of organization:

SME

Market sectors:

Mechanical engineering

Services provided:

Engineering
Consulting
Education/Training
Research and development
Services
Technology implementation

Smart Factory solution

ThingWorx - Industry Innovation Platform

Product/Solution webpage:

www.ptc.com/en/products/iot

Type of solution:

Product
Service

Smart Factory description:

ThingWorx is more than an IoT platform; it provides the functionality, flexibility and scalability that businesses need to drive industrial innovation — including the ability to source, contextualize and synthesize data while orchestrating processes and delivering powerful web, mobile and AR experiences.

ThingWorx delivers a single, purpose-built industrial IoT platform. Industrial market-leaders are using ThingWorx to develop feature-rich industrial IoT applications. With ThingWorx, you can rapidly explore, prove and master the value of smart, connected operations and products, even if your organization is new to IoT.

ThingWorx can deliver rapid industrial innovation, including:

- Improve customer experience
- Drive new revenue streams
- Optimize business processes
- Differentiate product and service offerings

Keywords:

IoT
Industrie 4.0
Smart Connected Product

Example of Product/Service usage:

- Elisa and ThingWorx bring industrial IoT to the factory https://bit.ly/2m0nruu
- Vodafone brings industrial IoT solutions to Smart Cities https://bit.ly/2zt6BOG
- Ericsson and PTC form IoT partnership https://bit.ly/2KxDMkq
- Bell and Howell Selects ThingWorx Platform to Enable Smart, Connected Service https://bit.ly/2AImZHy

Improvement areas covered by the Product/Solution:

Increased speed of production operations
Decreased manufacturing costs
Improved information for production decisions
Improved agility and responsiveness in the production process
Improved information for business analytics
Improved remote monitoring capabilities
Improved safety
Developed visualization capabilities

Product/Solution is related to the following type of implementation:

Implementation of the novel technology
Implementation in the production processes

Other relevant information about the product/service:

Attachment1: Company and Product Presentation
Attachment 2: Company logo / Solution/product logo

Attachment 3: ThingWorx - datasheets

Product/service technological focus:

ELECTRONICS, IT AND TELECOMMS
Information Processing & Systems, Workflow Networking
INDUSTRIAL MANUFACTURING, MATERIAL AND TRANSPORT
Industrial Manufacture Packaging / Handling
Process control and logistics

Market availability:

Available on market since 2015

13 PAUK

Smart Factory solution provider profile

Organization:

> **Vanado d.o.o.**
> Radnička cesta 47, 10000 Zagreb
> Croatia

Website and social media:

> Website: https://vanado.hr/

Contact details:

> David Burcar, CEO
> Tel: +385 (0)99 2112 542
> e-mail: david.burcar@vanado.hr

Type of organization:

> SME

Market sectors:

> Automotive industry
> Electrical and electronic engineering industries
> Mechanical engineering
> Cosmetics
> Defense industries
> Food industry
> Pressure equipment and gas appliances
> Raw materials, metals, minerals and forest-based industries
> Textiles, Fashion and creative industries

Services provided:

> Education/Training
> Engineering
> Manufacturing
> Research and development

Smart Factory solution

PAUK

Product/Solution webpage:

> https://vanado.hr/

Type of solution:

        Product

        Service

Smart Factory description:

Company Vanado specializes in development and implementation of systems for smart production management. Our product name is PAUK: **P**raćenje (tracking) **A**naliza (analysis) **U**šteda (savings) **K**ontrola (control).

Keywords:

        Smart manufacturing software

        cloud manufacturing execution system (MES)

        cloud production, industry 4.0

        industrial internet of things IIoT

        custom-made software

Figure 23: Statistical data

Example of Product/Service usage:

Maximum visibility and control of entire manufacturing process in real time, at any moment, wherever you may be. Regardless of the industry branch and its size the most valuable asset a company owns is the right piece of information.

PAUK is a customized software application which optimizes business processes with a special emphasis on production monitoring, machine maintenance and efficient energy management.

It is implemented faster and smoothly into small and medium companies of various industries.

PAUK is accessed through web browsers on standard computers using each employee's password-based authorization within the system.
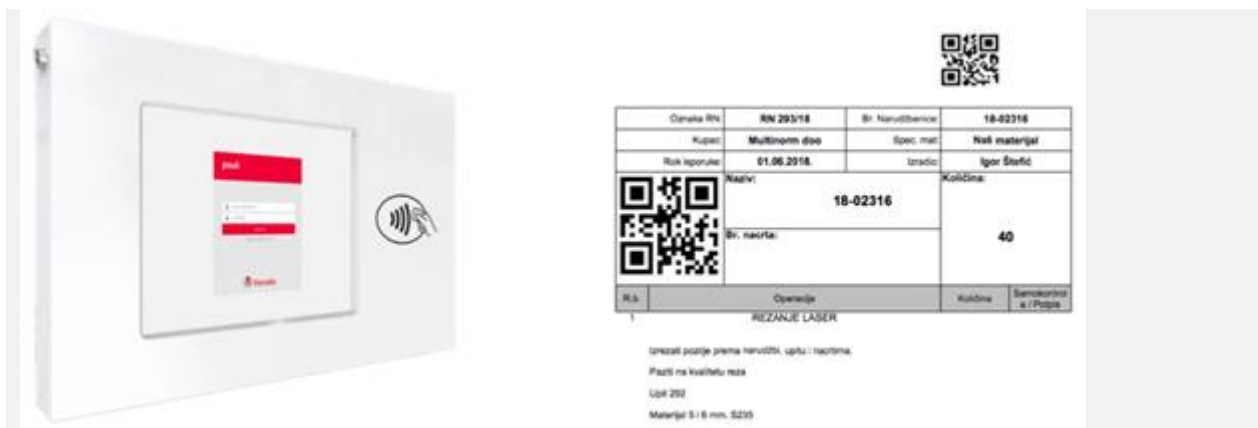
Figure 24: PAUK access process

Improvement areas covered by the Product/Solution:

       Increased speed of production operations
       Decreased manufacturing costs
       Improved information for production decisions
       Improved agility and responsiveness in the production process
       Improved information for business analytics
       Improved remote monitoring capabilities
       Improved safety
       Developed visualization capabilities

Product/Solution is related to the following type of implementation:

       Implementation of the novel technology
       Implementation in the production processes

Other relevant information about the product/service:

       Attachment1: Company and Product Presentation
       Attachment 2: Company logo / Solution/product logo
       Attachment 3: ThingWorx - datasheets

Product/service technological focus:

       ELECTRONICS, IT AND TELECOMMS
       Information Processing & Systems, Workflow Networking
       INDUSTRIAL MANUFACTURING, MATERIAL AND TRANSPORT
       Industrial Manufacture
       Packaging / Handling
       Plant Design and Maintenance
       Process control and logistics

Market availability:

       Available on market since 2014

14 Project management optimization in ENOVIA

Smart Factory solution provider profile

Organization:

CADCAM Group d.o.o.
Štoosova ulica 1, 10 000 Zagreb
Croatia

Website and social media:

Website: www.cadcam-group.eu
Social media (Facebook): https://bit.ly/2NBxHWH
Social media (LinkedIn): https://bit.ly/2N1rp1A

Contact details:

Eva Doboš
Tel. +385 95 503 5331
E-mail: Eva.Dobos@cadcam-group.eu

Type of organization:

SME

Market sectors:

Aeronautics industries
Automotive industry
Defense industries
Maritime industries
Mechanical engineering

Services provided:

Consulting
Education/Training
Engineering
Research and development
Services

Smart Factory solution

Project management optimization in ENOVIA

Product/Solution webpage:

https://bit.ly/2KTz9oV

Type of solution:

Product

Smart Factory description:

ENOVIA is a software for product lifecycle management (PLM) which covers a broad portfolio of technical and business applications. It supports collaboration throughout the entire company, and is fully integrated with design, engineering and analysis solutions from Dassault Systèmes. One of the disciplines under the ENOVIA brand is the *Product Planning and Program Management*.

Through several user roles inside ENOVIA's Project management (Project Manager, Project Team member, etc.) a company is able to track projects and their execution through deliverables, and project managers are able to make decisions based on data provided by ENOVIA (i.e. invisible governance).
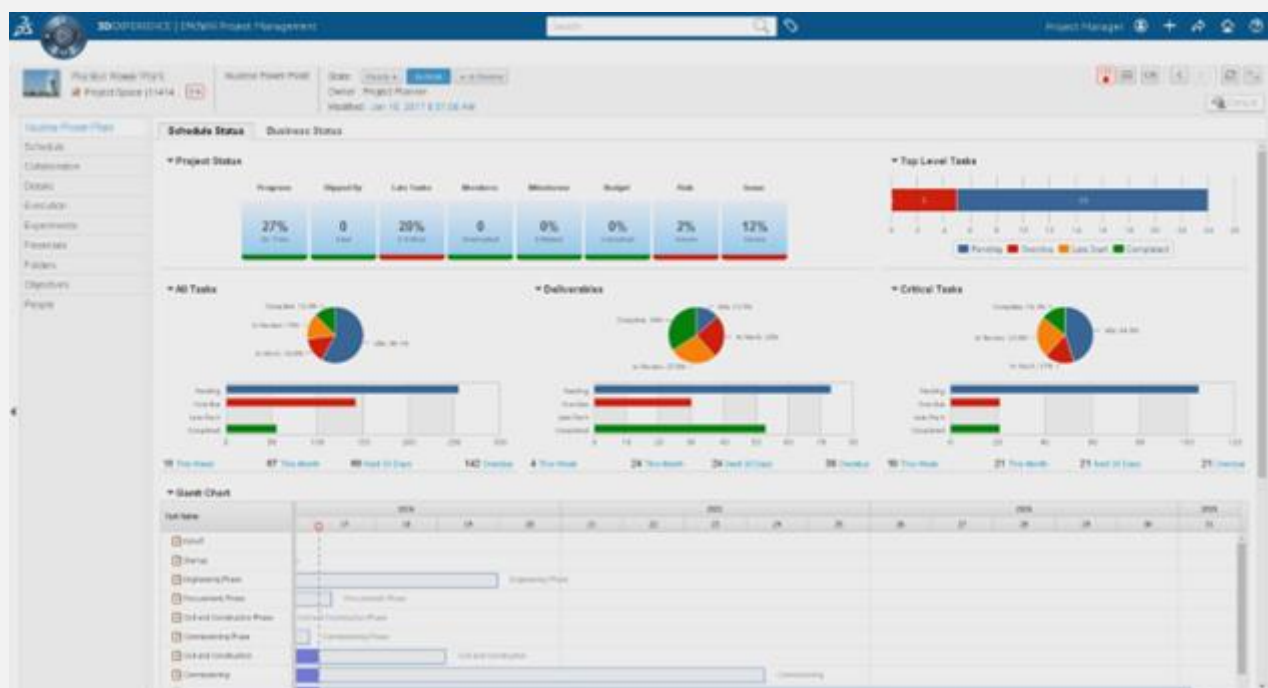

Figure 25: View of ENOVIA Project management GUI showing project status, tasks, deliverables, and a Gant chart

The Project management discipline in ENOVIA features:
- Program and project management
- View of budget spending (current vs. projected)
- Risk management based on real-time information provided by the system
- Issue reporting and monitoring
- Recognizing potential issues and risks before they materialize
- Critical project pathways presented in a Gant chart
- Resource management and resource allocation (possibility of allocating employees part time on tasks)
- Smart notification system which can be connected to email

- Intuitive and customizable user interface available through web browser or via mobile app.
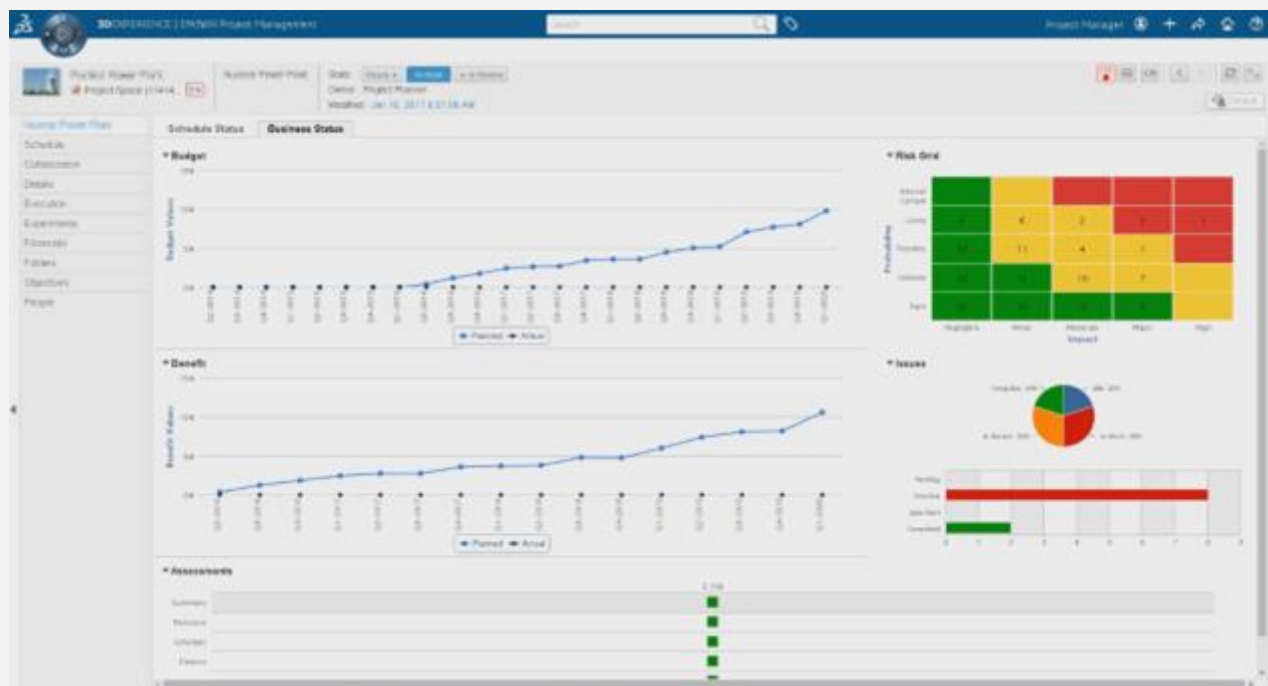

Figure 26: View of ENOVIA Project management GUI showing budget spending over time, and status of issues

Keywords:

Collaboration
Project management
Risk management
Invisible governance

Example of Product/Service usage:

A company is managing more projects at the same time, when at a certain moment, a critical issue occurs which temporarily stops the project until the issue is resolved. By using ENOVIA Project management, the project member who encountered the issue is able to easily report the issue through the system and suggest potential ways to resolve it. On the other hand, the project manager, who is away on a business trip, receives an email with the reported issue, and opens the issue with all the details inside his or her mobile app. He or she is able to easily see the impact of the issue on the whole project – project timeline, budget, which members are on standby due to the impossibility of working the subsequent tasks, and can easily rearrange them on other projects until the issue is resolved. All the information he or she receives through ENOVIA Project management are based on information provided by ENOVIA itself.

Improvement areas covered by the Product/Solution:

Implementation of the novel technology

Product/Solution is related to the following type of implementation:

Increased speed of production operations

Decreased manufacturing costs

Improved information for production decisions

Improved agility and responsiveness in the production process

Improved information for business analytics

Other relevant information about the product/service:

Attachment 1: ENOVIA logo

Attachment 2: ENOVIA Project Management presentation

Attachment 3: ENOVIA webpage (https://bit.ly/2N1lPfk)

Product/service technological focus:

Information Processing & Systems, Workflow

Process control and logistics

Creative services

Education and Training

Market availability:

Available on the market since 2013, as part of ENOVIA brand.

15 CATIA CNC Machining

Smart Factory solution provider profile

Organization:

> **CADCAM Group d.o.o.**
> Štoosova ulica 1, 10 000 Zagreb
> Croatia

Website and social media:

> Website: www.cadcam-group.eu
> Social media (Facebook): https://bit.ly/2NBxHWH
> Social media (LinkedIn): https://bit.ly/2N1rp1A

Contact details:

> Eva Doboš
> Tel. +385 95 503 5331
> E-mail: Eva.Dobos@cadcam-group.eu

Type of organization:

> SME

Market sectors:

> Aeronautics industries
> Automotive industry
> Defense industries
> Maritime industries
> Mechanical engineering

Services provided:

> Consulting
> Education/Training
> Engineering
> Research and development
> Services

Smart Factory solution

CATIA CNC Machining

Product/Solution webpage:

> https://bit.ly/2J6LuRr

Type of solution:

> Product

Smart Factory description:

CATIA Machining offers the highest quality products and solutions that enable manufacturers to plan, simulate and optimize machine-processing with the aim of producing quality products. It significantly reduces total production time, ensuring maximum product quality and efficiency.

CATIA CNC Machining easily defines NC programs dedicated to machining complex 3D parts (aerospace, hydraulic, turbo-machinery, etc.) within a single workbench including 2.5 to 5-axis machining technologies. Complementary to other V5 Machining solutions, this product brings new functionalities in order to cover the entire machining process, in addition to existing key functionalities that speed up skill oriented operations. All these functionalities overtake previous version CATIA Machining solutions, and therefore surpass existing all-in-one CAM systems.
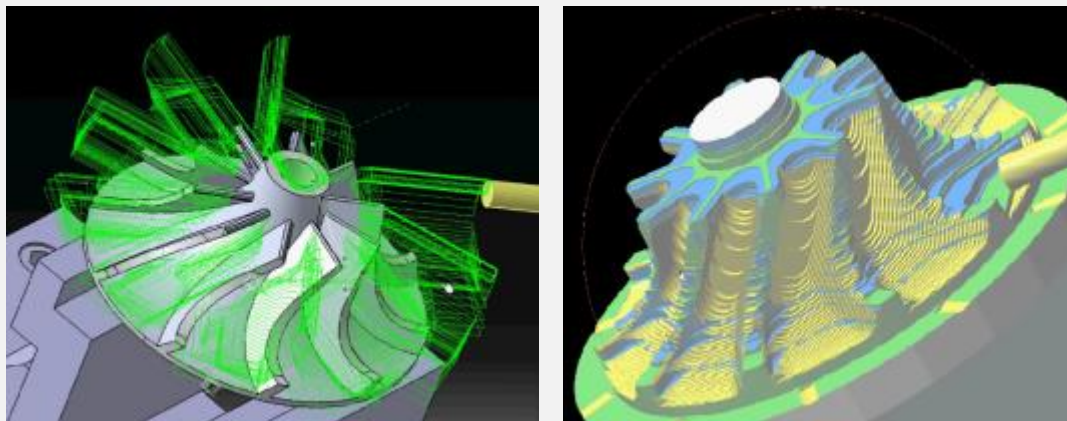

Figure 27: CATIA CAM 5-axis machining

CATIA Machining offers the following main functions:

- High efficiency in-part programming
- Effective change management
- High level of automation and standardization
- Optimized tool paths and reduced machining time
- Easy-to-learn and easy-to-use products
- Reduced administration costs and skills efforts
- Accurate milling and drilling machining capabilities through a full set of 2,5 to 5-axis machines

Keywords:

CNC
CAM
Computer aided manufacturing
Multiaxis machining
Milling
Lathe

Example of Product/Service usage:
Companies can use CAM to increase production, decrease machining time, and therefore reduce costs through an easy-to-use interface.

Improvement areas covered by the Product/Solution:
Implementation of the novel technology
Implementation in the production processes

Product/Solution is related to the following type of implementation:
Increased speed of production operations
Decreased manufacturing costs
Improved information for production decisions
Improved agility and responsiveness in the production process
Improved product quality
Improved compliance with customer specs or regulatory requirements

Other relevant information about the product/service:
Attachment 1: CATIA logo
Attachment 2: CATIA CAM presentation
Attachment 3: CATIA webpage (https://bit.ly/2J6LuRr)

Product/service technological focus:
Information Processing & Systems, Workflow
Design and Modelling / Prototypes
Industrial Manufacture
Process control and logistics
Creative services
Education and Training

Market availability:
Available on the market since 1981, as part of CATIA brand.

16 HTEUREP

Smart Factory solution provider profile

Organization:
HT-EUREP d.o.o.
Vodovodna 20A, 10000 Zagreb
Croatia

Website and social media:
Website: www.hteurep.hr
Social media (Facebook): www.facebook.com/HTEurep
Social media (LinkedIn): https://bit.ly/2m2H2u4

Contact details:
Renato Sladović
Tel. +385 91 9500 252
Email: renato.sladovic@hteurep.hr

Type of organization:
SME

Market sectors:
Aeronautics industries
Automotive industry
Construction
Defense industries
Electrical and electronic engineering industries
Mechanical engineering

Services provided:
Consulting
Education/Training
Engineering
Manufacturing
Research and development

Smart Factory solution

HTEUREP

Product/Solution webpage:
http://www.hteurep.hr/3ds

Type of solution:
Product
Service

Smart Factory description:
CAD/PLM – ERP Interface connects CAD/PLM systems with ERP system, thus enabling significant time savings and error elimination. Integrating these two systems synchronizes two previously separated worlds, makes data exchange simple and transparent, and reduces time engineers spend on entering BOM data in the ERP systems, reduces time spent on searching for products and removes error and data duplication and redundancy.

Currently it connects CATIA and SOLIDWORKS CAD applications, with or without ENOVIA PLM system to GOSOFT ERP system, with other combinations being planned or could be developed on request.
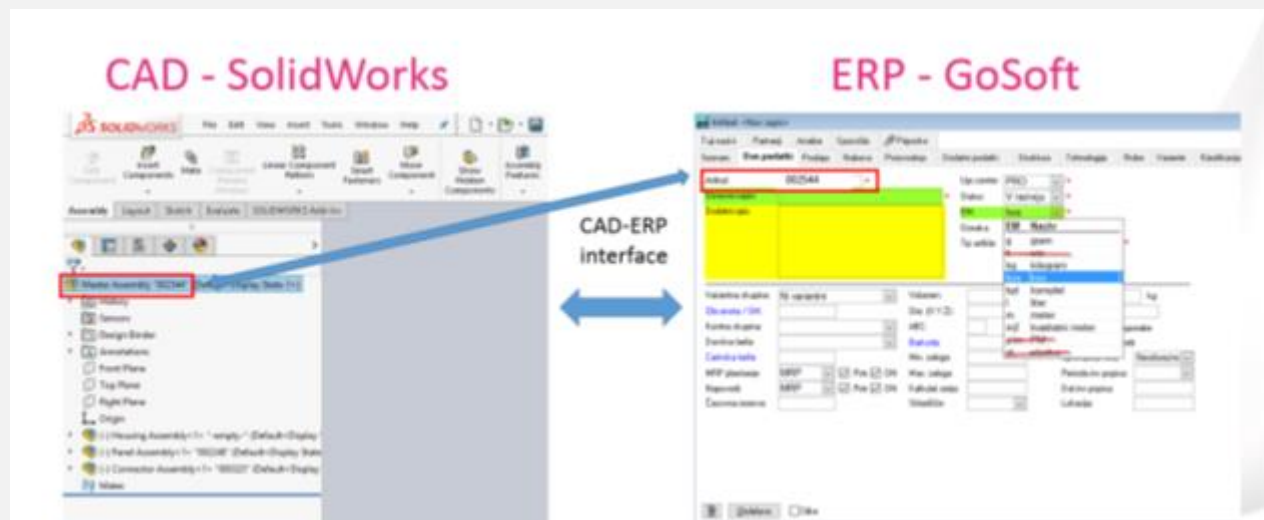

Figure 28: CAD-ERP interface

Keywords:
CAD Computer Aided Design
PLM Product Lifecycle Management
ERP Enterprise Resource Planning
Construction
Data Management
Bill of Material

Example of Product/Service usage:

Most production companies do not have their CAD or PLM system integrated with their ERP system. This way, product information has to be manually exchanged between systems which causes additional, unnecessary work and can easily cause errors and data multiplication.

By integrating these two systems, engineers have access to product data while doing construction work which improves use of existing parts, components and assemblies, and also the product data from current project is entered automatically into ERP system for further processing such as warehouse management, purchase etc.

Data duplication and redundancy is avoided and possibility of errors removed.

Improvement areas covered by the Product/Solution:

Implementation in the production processes

Product/Solution is related to the following type of implementation:

Improved coordination with suppliers

Increased speed of production operations

Decreased manufacturing costs

Improved information for production decisions

Improved agility and responsiveness in the production process

Improved product quality

Improved information for business analytics

Other relevant information about the product/service:

Attachment 1: HT- EUREP logo

Attachment 2: HT- EUREP presentation

Product/service technological focus:

Aerospace Technology

Construction Technology

Design and Modelling / Prototypes

Industrial Manufacture

Other Industrial Technologies

Market availability:

Available on the market.

17 Topomatika d.o.o.

Smart Factory solution provider profile

Organization:

 TOPOMATIKA d.o.o.
 Ilica 231, HR-10000 Zagreb
 Croatia

Website and social media:

 Website: www.topomatika.hr
 Social media (Facebook): https://www.facebook.com/topomatika/
 Social media (Twitter):
 Social media (LinkedIn): https://www.linkedin.com/company/topomatika-d.o.o./
 Social media (Google+):

Contact details:

 Tomislav Hercigonja
 Tel. +385 1 3496010
 e-mail t.hercigonja@topomatika.hr

Type of organization:

 SME

Market sectors:

 Aeronautics industries
 Automotive industry
 Mechanical engineering

Services provided:

 Engineering
 Manufacturing
 Research and development
 OTHER – Quality Control and Testing

Smart Factory solution

Topomatika

Product/Solution webpage:
>   http://topomatika.hr/proizvodi.html

Type of solution:
>   Product
>   Service

Smart Factory description:

Topomatika d.o.o. deals with 3D digitization or 3D scanning, measurement and control of shapes, dimensions, displacement and deformations of objects ranging from ten millimeters to several tens of meters, reverse engineering, rapid prototyping and digital manufacturing.

For this purpose, we use the state-of-the-art three-dimensional optical measuring systems and software for:

>   • design and development,
>   • product quality control,
>   • design of models, tools and molds,
>   • copying parts and products,
>   • creating documentation, archiving and computer presentations

We are a competent team with many years of experience. We can help you to better, easier and faster implement your projects in: automotive industry, tooling, casting, polymers processing, sheet metal processing, shipbuilding, medicine, dentistry, architecture, archeology and many others.

Keywords:
>   3D measurement
>   3D scanning
>   Reverse Engineering
>   DSSP (Digital Shape Sampling and Processing)
>   Material and Component Testing
>   DIC

Example of Product/Service usage:
>   The 3D digitizer, for full-field measurements of surfaces, is utilized world-wide in the injection-molding and plastic-processing industry for form and dimension inspection of injection-molded parts.

Figure 29: Application in automotive industry

Due to the 3D full-field color deviation plot, the evaluation of parts is considerably faster and much more efficient compared to conventional measuring methods. In particular warpage and shrinkage of injection-molded parts are fast and clearly displayed speeding up mold try-out and production control. Thus, the technology allows companies to keep pace with shorter product cycles and faster lead times.
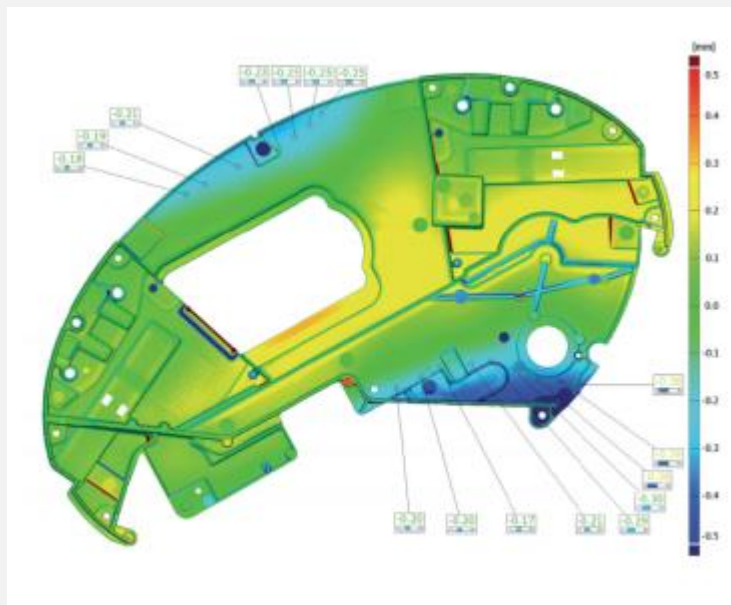

Figure 30: Optical 3D displacement and deformation measurement

Improvement areas covered by the Product/Solution:

      Improved coordination with suppliers

      Increased speed of production operations

      Decreased manufacturing costs

      Improved information for production decisions

      Improved agility and responsiveness in the production process

      Improved product quality

Improved coordination with customers
Improved compliance with customer specs or regulatory requirements

Product/Solution is related to the following type of implementation:
Implementation of the novel technology
Implementation in the production processes

Other relevant information about the product/service:
Attachment 1: Topomatika logo
Attachment 2: Topomatika presentation

Product/service technological focus:
Aerospace Technology
Design and Modelling / Prototypes
Industrial Manufacture
Materials Technology
Process control and logistics
Measurement Tools

Market availability:
Available on the market since 2000.