

**DOCUMENT TITLE:**

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# **SMART FACTORY SOLUTIONS FROM SLOVAKIA**

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

**Acronym: Smart Factory Hub**

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

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## Contents

1	THE DIGITAL TWIN OF AN INDUSTRIAL PRODUCTION LINE WITHIN THE INDUSTRY 4.0 CONCEPT.....	3
2	DIGITAL INTERNAL LOGISTICS VERIFICATION THROUGHOUT THE PLANT .....	6
3	COLLABORATIVE ROBOT INTEGRATED IN INDUSTRIAL ENVIRONMENT OF SMART FACTORY.....	9
4	BIN PICKING SOLUTION FOR FLEXIBLE AUTOMATION.....	12
5	VOLUMETRIC MEASUREMENTS BY UAV .....	16
6	SMALLEST PASSIVE CONTACTLESS SENSORS OF PHYSICAL QUANTITIES IN THE WORLD.....	20
7	ORANGE BOX.....	24
8	SMART FACTORY – TIA (TOTALLY INTEGRATED AUTOMATION).....	28
9	eDOCU SMART FACTORY .....	31
10	3DIMENSION SUPPORTED BY MYMEDIA.....	44
11	INFOTECH - OPEN RTLS (REAL TIME LOCATING SERVICES) PLATFORM.....	48

# 1 THE DIGITAL TWIN OF AN INDUSTRIAL PRODUCTION LINE WITHIN THE INDUSTRY 4.0 CONCEPT

## Smart Factory solution provider profile

### Organization:

**Sova Digital, a.s., Bratislava**

Bojnická 3,

831 04 Bratislava, Slovakia

### Website and social media:

Website: [www.sova.sk](http://www.sova.sk), <http://industry4.sk/>

Social media (Facebook):

Social media (Twitter):

Social media (LinkedIn):

Social media (Google+):

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Contact person: Milan Lokšík

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E-mail: [info@sova.sk](mailto:info@sova.sk), [info@industry4.sk](mailto:info@industry4.sk)

Website: [www.sova.sk](http://www.sova.sk), <http://industry4.sk/>

### Type of organization:

SME

### Market sectors:

- Mechanical engineering
- Electrical and electronic engineering industries
- Automotive industry

### Services provided:

- Consulting
- Manufacturing
- Research and development
- Engineering

## Smart Factory solution

### THE DIGITAL TWIN OF AN INDUSTRIAL PRODUCTION LINE WITHIN THE INDUSTRY 4.0 CONCEPT

**Product/Solution webpage:**

[www.sova.sk](http://www.sova.sk)

**Type of solution:**

- Product

**Smart Factory description:**

This solution is strongly tied with the “Smart Factory” concept, as a novel technology. Digital twin collects and evaluates the information continuously, allowing, among other things, to shorten and streamline the production cycle, reduce the rise time of introducing new products, detecting inefficient settings of the underlying processes. The concept of the digital twin, therefore, is built on the principle known today as Industry 4.0.

The digital twin is formed by the physical production line and its digital “copy”. The major feature of this arrangement is the interface, through which data exchange takes place. The digital part is based on the simulation tool called Plant Simulation (PS) made by SIEMENS. The digital simulation model of the production line was created in this environment. This model was a detailed virtual copy of the physical process.

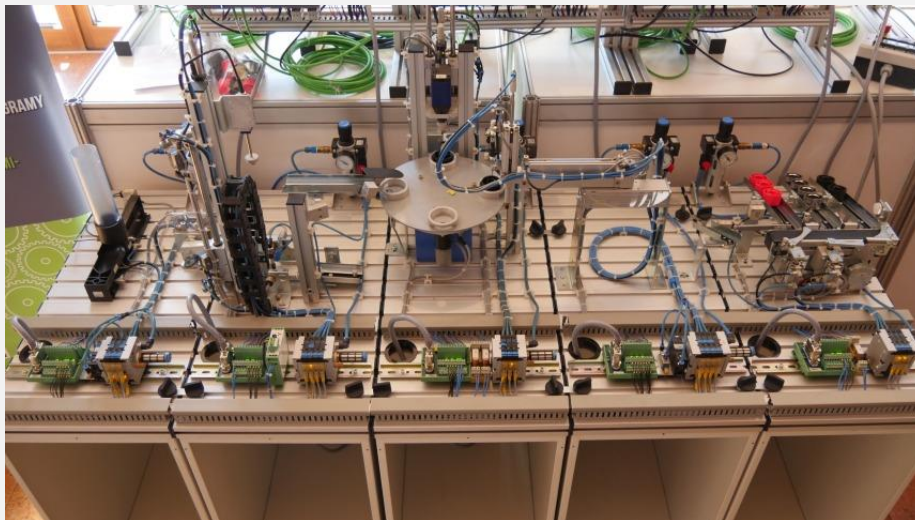


Fig. 1 – Digital Twin

**Keywords:**

Digital twin, Optimization of production, Genetic algorithm, Data collection

**Example of Product/Service usage:**

Embraco Slovakia s.r.o. started cooperation with the company Sova Digital a.s. in late 2016. Sova Digital offered integration of the digital twin (DT). A DT is essentially a functional system of continuous process optimization, which is formed by the cooperation of physical production lines with a digital “copy. It creates the digital factory environment, in which the company can optimize the operation directly through the production chain, manipulate parameters and production processes; adapting the product to market requirements.

From the costs perspective, the solution proved to be highly efficient, as it requires minimum intervention (only software and extra sensors when they needed) and further investments after implementation are not needed.

The solution led to a significant decrease in faulty and non-conforming products reported by customers, which, in turn, increased customer satisfaction.

Solution can be applied by other companies that are willing to integrate digital twin and the digital simulation model of the production line for continuous process optimization. The practice has a high degree of portability and can be adapted to companies operating in various industry branches. It must be noted, however, that it initially requires a medium financial commitment and the organizational culture should be open to the use of new technologies.

**Improvement areas covered by the Product/Solution:**

- Increased speed of production operations
- Decreased manufacturing costs
- Improved information for production decisions
- Improved maintenance/uptime
- Improved product quality
- Improved agility and responsiveness in the production process
- 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: Company logo

Attachment 2: Product presentation:

([http://default.sopk.sk/downloads/SFH/DD\\_milo.pptx](http://default.sopk.sk/downloads/SFH/DD_milo.pptx) )

**Product/service technological focus:**

- Industrial Manufacture
- Information Processing & Systems, Workflow

**Market availability:**

Available on the market since 2016

## 2 DIGITAL INTERNAL LOGISTICS VERIFICATION THROUGHOUT THE PLANT

### Smart Factory solution provider profile

**Organization:**

**Sova Digital, a.s., Bratislava**

Bojnická 3,  
831 04 Bratislava, Slovakia

**Website and social media:**

Website: [www.sova.sk](http://www.sova.sk), <http://industry4.sk/>

Social media (Facebook):

Social media (Twitter):

Social media (LinkedIn):

Social media (Google+):

**Contact details:**

Contact person: Milan Lokšík

Phone: +421 2 4333 0643, +421 2 4333 0372

E-mail: [info@sova.sk](mailto:info@sova.sk), [info@industry4.sk](mailto:info@industry4.sk)

Website: [www.sova.sk](http://www.sova.sk), <http://industry4.sk/>

**Type of organization:**

SME

**Market sectors:**

- Mechanical engineering
- Electrical and electronic engineering industries
- Automotive industry

**Services provided:**

- Consulting
- Manufacturing
- Research and development
- Engineering

### Smart Factory solution

#### DIGITAL INTERNAL LOGISTICS VERIFICATION THROUGHOUT THE PLANT

**Product/Solution webpage:**

[www.sova.sk](http://www.sova.sk)

**Type of solution:**

- Product

**Smart Factory description:**

This solution is strongly tied with the “Smart Factory” concept, as a novel technology. Digital internal logistics verification throughout the plant collects and evaluates the information continuously, allowing, among other things, to shorten and streamline the production cycle, reduce the rise time of introducing new products, detecting inefficient settings of the underlying processes. The concept of the digital twin, therefore, is built on the principle known today as Industry 4.0.

The Digital internal logistics verification throughout the plant is formed by the physical production line and its digital “copy”. The major feature of this arrangement is the interface, through which data exchange takes place. The digital part is based on the simulation tool called Plant Simulation (PS) made by SIEMENS. The digital simulation model of the production line was created in this environment. This model was a detailed virtual copy of the physical process.

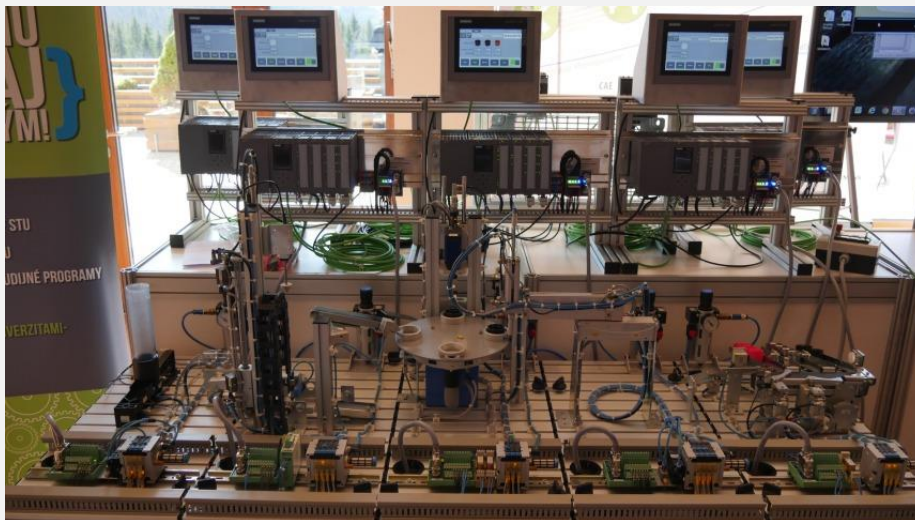


Fig. 2 – Digital Twin

**Keywords:**

Digital, Logistics, Optimization of production, Genetic algorithm, Data collection

**Example of Product/Service usage:**

Honeywell Turbo s. r. o. (Ltd.), started cooperation with the company Sova Digital a.s. in late 2016. Sova Digital offered integration of the digital internal logistics verification throughout the plant this is essentially for a functional system of continuous process optimization, which is formed by the cooperation of physical production lines with a digital “copy. It creates the digital factory environment, in which the company can optimize the operation directly through the production chain, manipulate parameters and production processes; adapting the product to market requirements.



The solution led to a significant decrease in faulty and non-conforming products reported by customers, which, in turn, increased customer satisfaction.

Solution can be applied by other companies that are willing to integrate digital internal logistics verification throughout the plant into their manufacturing process, especially those that have operators involved in product assembly activities. The practice has a high degree of portability and can be adapted to companies operating in various industry branches. The solution can be used on any type of SME or large company.

**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 maintenance/uptime
- Improved product quality
- Improved agility and responsiveness in the production process
- 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: Product presentation:

([http://default.sopk.sk/downloads/SFH/DD\\_milo.pptx](http://default.sopk.sk/downloads/SFH/DD_milo.pptx) )

**Product/service technological focus:**

- Industrial Manufacture
- Information Processing & Systems, Workflow

**Market availability:**

Available on the market since 2016



### 3 COLLABORATIVE ROBOT INTEGRATED IN INDUSTRIAL ENVIRONMENT OF SMART FACTORY

#### Smart Factory solution provider profile

**Organization:**

**MATADOR Automation, s.r.o.**  
Továrenská 1,  
018 41 Dubnica nad Váhom, Slovakia

**Website and social media:**

Website: [www.matador-group.eu](http://www.matador-group.eu)  
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Social media (LinkedIn):  
Social media (Google+):

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E-mail: [maros.mudrak@matador-group.eu](mailto:maros.mudrak@matador-group.eu)  
Website: [www.matador-group.eu](http://www.matador-group.eu)

**Type of organization:**

SME

**Market sectors:**

- Mechanical engineering
- Automotive industry

**Services provided:**

- Consulting
- Research and development
- Engineering

#### Smart Factory solution

#### COLLABORATIVE ROBOT INTEGRATED IN INDUSTRIAL ENVIRONMENT OF SMART FACTORY

**Product/Solution webpage:**

[www.matador-group.eu](http://www.matador-group.eu)

**Type of solution:**

- Product

**Smart Factory description:**

In 2014 company started to focus its activities on higher degree of robotics. Trends in this field showed that one of the most important integrations will be robots capable of cooperation with humans. Our company has own development and research capacities, that is why we created this solution.

Solution is fully compatible with Smart Factory and it follows the trends in Smart Factory. It is fully integrated with other systems and it can communicate with its environment in IoT meaning, but also in communication with humans.

Design of safe workplace with multi-axis robot, which can help the human operator, eventually it can replace him within difficult operations. Important is the repeatability and full integrity between operators without the necessity of safety barriers usage.



Fig. 3 – Collaborative robot integrated in ŠKODA AUTO a.s. Vrchlabí (Czech Republic)

**Keywords:**

Collaborative robot

**Example of Product/Service usage:**

Target customers are all industrial corporations, which perform assembly tasks or manipulation with parts performed by human operator. The solution can be used on any type of SME or large company. Implementation will increase the quality of production and reduce non-ergonomic work of human workers. This solution can be used in any type of production.

Quality is ensured by fully integration and repeatability of solution itself. Before implementation, very precise analysis of specific application is done. Consequently, safety risks and their elimination are evaluated and implemented.

It is needed to realize and accept the technology by the people, which will cooperate with the robot. They must accept him as a partner, not as a replacement. Every implementation is modified for specific environment and it needs full cooperation between integrator and customer, which better knows the specification of his environment.

This solution is specified by implementation of collaborative robots, which can be implemented near the human workers or they can directly cooperate their actions with humans in production process. Integration of such solution will increase the quality of production operations and repeatability of production itself.

**Improvement areas covered by the Product/Solution:**

- Increased speed of production operations
- Improved agility and responsiveness in the production process
- Improved maintenance/uptime
- Improved product quality
- Improved safety

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

- Implementation of the novel technology

**Other relevant information about the product/service:**

Attachment1: Company logo

Attachment 2: Video about SF solution

(<https://www.youtube.com/watch?v=c3GZ2Q0QLP8> )

**Product/service technological focus:**

- Industrial Manufacture

**Market availability:**

Available on the market since 2014

## 4 BIN PICKING SOLUTION FOR FLEXIBLE AUTOMATION

### Smart Factory solution provider profile

**Organization:**

**Photoneo s.r.o.**  
Jamnického 3,  
841 05 Bratislava, Slovakia

**Website and social media:**

Website: [www.photoneo.com](http://www.photoneo.com)  
Social media (Facebook):  
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Social media (LinkedIn):  
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**Contact details:**

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Phone:  
E-mail: [zizka@photoneo.com](mailto:zizka@photoneo.com)  
Website: [www.photoneo.com](http://www.photoneo.com)

**Type of organization:**

SME

**Market sectors:**

- Mechanical engineering
- Automotive industry
- Electrical and electronic engineering industries
- Food industry

**Services provided:**

- Consulting
- Research and development
- Engineering

### Smart Factory solution

#### BIN PICKING SOLUTION FOR FLEXIBLE AUTOMATION

**Product/Solution webpage:**

[www.photoneo.com](http://www.photoneo.com)

**Type of solution:**

- Product

### Smart Factory description:

Company has developed own 3D scanner called PhoXi Scan and own software for control of the robot based on ROS. Bin picking Solution is composed of these parts:

1. Robot
2. 3D scanner
3. Bin Picking SDK Software

The demanding needs on automation require nowadays complex systems which very often can be achieved only with the help of industrial robots. Therefore we cooperate with different robot producers and integrate their robots in to our production solutions. Bin picking by Photoneo is a new technology, which leads to autonomous bin picking workplace. Such workplace is an essential part of Smart Factory. Increasing the efficiency of robotic work cells is directly connected to autonomous robot problem. Such solutions are requested in Smart Factory. The robotic vision and 3D scanning systems become more and more important for automation solutions since the need to automate even smaller production quantities and therefore create flexible automation solutions is growing.



*Fig. 4 – Bin picking model*

Our solution brings new approach (technology) to bin picking by robot. We are capable to analyse 3D data in bins and compare it with CAD model of the picked part. Analysis then decides which part is sizable for the robot. By the application of such procedure the robot is able to pick all the parts in bin without any help of human. This brings very effective solutions in industries, where assemblies or similar process are needed.



*Fig. 5 – Bin picking in practice*

**Keywords:**

Bin picking, Robotics, Scanner

**Example of Product/Service usage:**

Solution led to more efficient production and reduction of costs for human labour. Our good practice can be applied to any customer, which requires autonomous removing of components from the bins. First we will provide primary study of the workplace and then if all aspects of the customer are redeemable, we provide also the integration of solution including various types of robots. Application of bin picking is very easy. Created software solution allows it in three steps:

1. Insert CAD model.
2. Capture 3D scene.
3. Get localized results.

As any automation device, the primary costs are higher than recruit some human labour. However, if production volumes are also higher, then the costs are also reduced. Our customer must count with several months for implementation.

The solution can be implemented in a wide range of industrial companies (automotive, food, electronics). Our product can be also used as a smaller part of more complex system, when system requires:

1. 3D object recognition
2. Inspection of object placement
3. General inspection and analysis

Solution can be expanded by more appropriate software and new versions of PhoXi scanner.

**Improvement areas covered by the Product/Solution:**

- Increased speed of production operations
- Improved agility and responsiveness in the production process
- Improved maintenance/uptime

- Improved safety

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

- Implementation of the novel technology

**Other relevant information about the product/service:**

Attachment1: Company logo

Attachment 2: Video about SF solution

([https://www.youtube.com/watch?v=8aOiKJ5\\_QsU](https://www.youtube.com/watch?v=8aOiKJ5_QsU))

(<https://www.youtube.com/watch?v=azsxHA2urdY>)

**Product/service technological focus:**

- Industrial Manufacture

**Market availability:**

Available on the market since 2016



## 5 VOLUMETRIC MEASUREMENTS BY UAV

### Smart Factory solution provider profile

**Organization:**

**UAVONIC s.r.o.**  
Galvaniho 17/B,  
821 04 Bratislava

**Website and social media:**

Website: [www.uavonic.com](http://www.uavonic.com)  
Social media (Facebook):  
Social media (Twitter):  
Social media (LinkedIn):  
Social media (Google+):

**Contact details:**

Contact person: Juraj Dudáš  
Phone:  
E-mail: [dudas@uavonic.com](mailto:dudas@uavonic.com)  
Website: [www.uavonic.com](http://www.uavonic.com)

**Type of organization:**

SME

**Market sectors:**

- Mechanical engineering
- Automotive industry
- Electrical and electronic engineering industries
- Food industry
- Construction

**Services provided:**

- Consulting
- Research and development
- Engineering

### Smart Factory solution

#### BIN PICKING SOLUTION FOR FLEXIBLE AUTOMATION

**Product/Solution webpage:**

[www.uavonic.com](http://www.uavonic.com)

**Type of solution:**

- Product

- Service

### Smart Factory description:

Volumetric measurement by UAV devices is a modern method allowing for example inspection of outdoor storage with high capacity. This method can replace employees with standard measuring devices, which have higher inaccuracies and their usage is time consuming or there is a risk of potential injury. Volumetric measurements by UAV are composed of aerial pictures created by calibrated cameras or laser scanners. This data are consequently processed in software, which creates digital 3D model of measured material. Accuracy of this process is higher than the other standard measuring methods.



Fig. 6 – Volumetric Measurements by UAV

Our approach is characterized by novel technologies as precise cameras or laser scanners and by intelligent software solutions. It is clear that smart factory needs smart control and smart control is characterized by smart and precise measuring. Our approach brings novel approach to volumetric measurements in any segment of the industry.

Technical solution is characterized in two ways:

1. novel hardware – precise cameras with laser scanners
2. novel software – data fusion and fast volumetric measurements of high capacity storage



*Fig. 7 – Volumetric Measurements by UAV*

**Keywords:**

Volumetric measurements, Camera, Laser scanner

**Example of Product/Service usage:**

The solution can be used on any type of SME or large company also in Public institutions. For example: industrial enterprises, academic sector, agriculture, forestry, construction, environmental sectors etc.

Solution led to a significant optimization of logistics in company. It depends individually on the application and request of the customers. We are able to provide basic study for the customer and then the customer decides, if he/she is able to cooperate on such solution.

Impact of this solution is positive in the manner of control of whole producing process. Partner exactly knows, what amount of material he has available for production and consequently he can optimize whole logistic and save the costs.

System is limited by environment around the storage. If the storage is outside, our system is not able to measure when the weather is not suitable for the flight of UAV. Moreover, it is also limited in some dusty or in other ways disadvantageous for UAV technology.

Selling points – the real or perceived benefits:

1. Safety
2. High resolution
3. Costs saving
4. Time efficiency

Solution is dependent on used hardware and software. With the development of more precise sensors and more intelligent software the solution will acquire even more precise results.

**Improvement areas covered by the Product/Solution:**

- Improved coordination with suppliers

- Improved coordination with customers
- Improved remote monitoring capabilities
- Developed visualization capabilities
- Improved agility and responsiveness in the production process
- Improved maintenance/uptime
- Improved safety

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

- Implementation of the novel technology

**Other relevant information about the product/service:**

Attachment1: Company logo

Attachment 2: Product presentation: UAVONIC\_VOLUMETRIC MEASUREMENTS BY UAV\_V2.pptx, (<https://uavonic.com/volumetric-measurements/> )

**Product/service technological focus:**

- Industrial Manufacture
- Agriculture
- Technologies for the food industry
- IT and Telematics Applications
- Electronic measurement systems
- Measurement Tools

**Market availability:**

Available on the market since 2016

## 6 SMALLEST PASSIVE CONTACTLESS SENSORS OF PHYSICAL QUANTITIES IN THE WORLD

### Smart Factory solution provider profile

**Organization:**

**RVmagnetics, a.s.**  
Hodkovce 21,  
04 421 Hodkovce, Slovakia

**Website and social media:**

Website: [www.rvmagnetics.com](http://www.rvmagnetics.com)  
Social media (Facebook):  
Social media (Twitter):  
Social media (LinkedIn):  
Social media (Google+):

**Contact details:**

Contact person: Michal Borza  
Phone: +421 918 885 538  
E-mail: [info@rvmagnetics.com](mailto:info@rvmagnetics.com)  
Website: [www.rvmagnetics.com](http://www.rvmagnetics.com)

**Type of organization:**

SME

**Market sectors:**

- Mechanical engineering
- Automotive industry
- Electrical and electronic engineering industries
- Construction
- Biotechnology
- Healthcare industries
- Pressure equipment and gas appliances

**Services provided:**

- Consulting
- Research and development
- Engineering

## Smart Factory solution

### SMALLEST PASSIVE CONTACTLESS SENSORS OF PHYSICAL QUANTITIES IN THE WORLD

**Product/Solution webpage:**

[www.rvmagnetics.com](http://www.rvmagnetics.com)

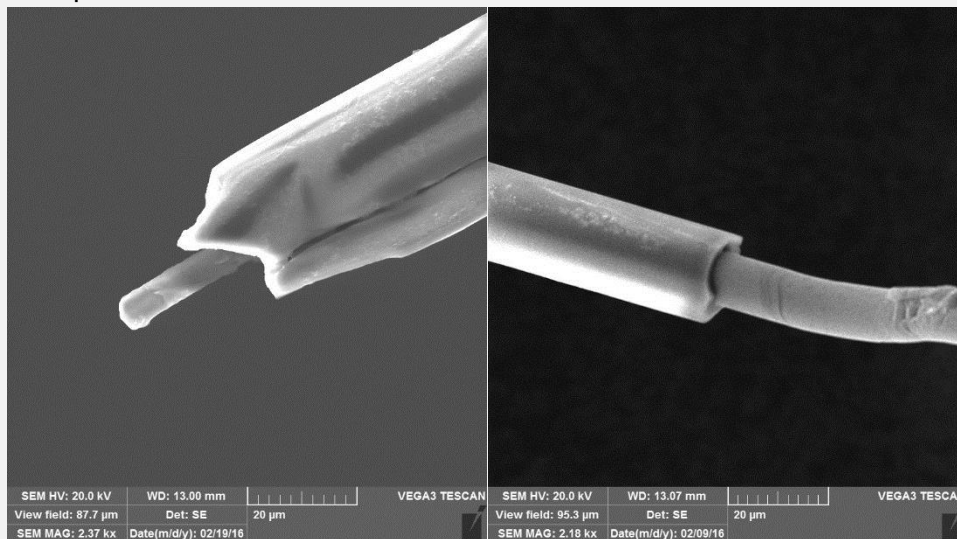
**Type of solution:**

- Product

**Smart Factory description:**

RVmagnetics bring to the market absolutely new generation of physical quantities sensors; based on microwire technology which offer to RVmagnetics's partners create smart goods from their standard portfolio. RVmagnetics's technology is ideal for IoT world and Industry 4.0

With RVmagnetics's technology could be goods of our partners smarter, more effective, self-diagnosed and much more. The innovative nature of this solution is that it provides non-invasive testing, monitoring and measuring method for composites materials, which monitors the production process, application process and values from real use. With this technology partners can save the material costs, produce smarter goods and bring new added value for their partners.



*Fig. 8 – Smallest passive contactless sensor of the physical quantities*

RVmagnetics provides as simple as possible solution which we offer to our partners. From the costs perspective, the solution can save up to 30% of material costs for selected sectors (composites materials), or provide new and high added value with minimum initial costs.

Unique solution based on revolutionary technology which brings high added value for our partner and their customers.



**Benefits:**

1. Small dimensions – microwires can be embedded into the various structures without changing of mechanical properties of the structure (e.g. glass- and carbon- fibre composites, polymers, Ti implants, etc.);
2. Multifunctionality – single microwires can sense temperature, stress and position at the same time
3. Glass-coating is biocompatible, protects metallic nucleus from corrosion, short-circuits etc.;
4. Contactless sensing because of magnetic nature;
5. Imperishable – when a microwire is broken, two sensors are obtained (like braking a magnet results in getting two magnets)
6. Small dimensions allow constructions of network of sensors;
7. Low energy consumptions – can be powered by little battery or photovoltaic cells;
8. Simple sensing process – no electronics is necessary inside the construction;
9. Production process allows to produce thousands of sensors in short time;
10. Real time data – 1000x/sec;

**Keywords:**

Sensors, Structural health monitoring, Non-invasive, Innovative, Magnetic, IoT, Industry 4.0.

**Example of Product/Service usage:**

This solution can be implemented to a wide range of companies. It must be noted, however, that it initially requires a financial commitment and the organizational culture should be open to the use of new revolutionary technologies.

**Improvement areas covered by the Product/Solution:**

- Improved coordination with suppliers
- Improved coordination with customers
- Improved remote monitoring capabilities
- Developed visualization capabilities
- Improved agility and responsiveness in the production process
- Improved maintenance/uptime
- Improved safety
- Lower energy costs
- Decreased manufacturing costs

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

- Implementation of the novel technology

**Other relevant information about the product/service:**

Attachment1: Company logo

Attachment 2: Product presentation: RVMagnetics\_LDW PPT.pptx

Attachment 3: Video about SF solution: INTRO\_RVMagnetics.mp4,

([https://www.dropbox.com/sh/i6ygas0q7cn5i1e/AADZwFi2B\\_vtxps\\_m3hUP3rla?dl=0](https://www.dropbox.com/sh/i6ygas0q7cn5i1e/AADZwFi2B_vtxps_m3hUP3rla?dl=0))



Attachment 4: Product promo material: Leaflet RV.pdf

**Product/service technological focus:**

- Industrial Manufacture
- Agriculture
- Technologies for the food industry
- IT and Telematics Applications
- Electronic measurement systems
- Measurement Tools
- E-Health
- Industrial Biotechnology
- Construction Technology
- Materials Technology
- Physics
- Micro- and Nanotechnology
- Other Industrial Technologies

**Market availability:**

Available on the market since 2016

## 7 ORANGE BOX

### Smart Factory solution provider profile

**Organization:**

**B+R automatizace, spol. s r.o. - organizačná zložka**  
Trenčianska 17,  
915 01 Nové Mesto nad Váhom, Slovakia

**Website and social media:**

Website: [www.br-automation.com](http://www.br-automation.com)  
Social media (Facebook):  
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Social media (LinkedIn):  
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Website: [www.br-automation.com](http://www.br-automation.com)

**Type of organization:**

SME

**Market sectors:**

- Mechanical engineering
- Automotive industry
- Electrical and electronic engineering industries
- Food industry

**Services provided:**

- Consulting
- Engineering
- Services

### Smart Factory solution

#### ORANGE BOX

**Product/Solution webpage:**

[www.br-automation.com](http://www.br-automation.com)

**Type of solution:**

- Product

### Smart Factory description:

Robust control systems B&R provided HW platform for data acquiring (productivity, quality, energy consumption, operating state, ...) from machine in real time. These control systems perform data acquisition, their evaluation and display, and in consequence their transfer through communication standards as OPC UA, MQTT.... into superior control system, where analysis and reports are created.

OrangeBox allows upgrade to Smart factory of almost any production factory. It provides new communication technology OPC UA, MQTT, even for machines without own control system. Results of consequent data analysis have immediate impact on arrangements for increasing the productivity, effectivity, quality and energetic effectivity of machines and lines. At the same time it allows to follow the effects of changes on individual parameters, watching the trends and compering them with historical data.

OrangeBox is IIoT device, which creates the gate between the machine and analytical tool (server, cloud, edge controller). Innovation of this solution lies in its configurability without the need of programming or IT knowledge about OPC UA or MQTT. Moreover, the knowledge of PLC programming is also not needed.



Fig. 9 – Orange Box

System is essential for objective analysis of productivity, effectivity, energy consumption, etc. whereby return is determined by quality and speed of established actions.

Quality monitoring, search for contexts and trends tracking are the basic elements of system. Depth of knowledge about the impact on quality is proportional to the number of monitored variables and factors.

Implementation of basic system is simple and a handy maintenance technician is sufficient for the implementation. In the case of more difficult implementations, system integrator is needed. Handy technician, necessary HW, available network infrastructure, system can be implemented

in 1 hour.

After implementation of minimal configuration at a customer and after 2 days of measuring, this system was able to organizational actions, which increased overall utility of machine over 20%. Analysis brought surprising relations. Investment returns were defined on level of 3 weeks.

**Keywords:**

Quick implementation, Configurability, Simplicity, Flexibility

**Example of Product/Service usage:**

OrangeBox is configurable tool for measuring and evaluating the productivity, effectivity, and energy consumption, and it is suitable for predictive maintenance. Ideal tool for already existing production enterprises, view about OEE in real time (before once a shift or day). Frequently surprising detection of weak places in productivity, effectivity energy consumption and other unexpected relations.

The solution can be used on any type of SME or large company in all production enterprises. It was used for example in Slovakia, Germany and Austria.

**Improvement areas covered by the Product/Solution:**

- Improved information for production decisions
- Improved product quality
- Improved coordination with suppliers
- Improved coordination with customers
- Improved remote monitoring capabilities
- Developed visualization capabilities
- Improved agility and responsiveness in the production process
- Improved maintenance/uptime
- Improved safety
- Decreased manufacturing costs

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

- Implementation of the novel technology

**Other relevant information about the product/service:**

Attachment1: Company logo

Attachment 2: Product presentation: LDW PPT\_OrangeBox.pptx

(<https://www.br-automation.com/en/downloads/#categories=catalogues-and-brochures/products/orange-box> ),

**Product/service technological focus:**

- Industrial Manufacture
- Agriculture
- Technologies for the food industry
- Measurement Tools

- Construction Technology
- Other Industrial Technologies

**Market availability:**

Available on the market since 2016

## 8 SMART FACTORY – TIA (TOTALLY INTEGRATED AUTOMATION)

### Smart Factory solution provider profile

**Organization:**

**MERCHANT, s. r. o.**  
Štúrova 844/21,  
927 01 Šaľa, Slovakia

**Website and social media:**

Website: <http://merchant.sk/index.php/en/>

Social media (Facebook):

<https://www.facebook.com/Merchant-sro-154340671417651/>

Social media (Twitter):

Social media (LinkedIn): <https://www.linkedin.com/company/3483175>

Social media (Google+):

**Contact details:**

Contact person: Tomáš Mlynka

Phone: +421 944 094 455

E-mail: [tomas.mlynka@merchant.sk](mailto:tomas.mlynka@merchant.sk)

Website: <http://merchant.sk/index.php/en/>

**Type of organization:**

SME

**Market sectors:**

- Mechanical engineering
- Automotive industry

**Services provided:**

- Consulting
- Education/Training
- Research and development
- Services

### Smart Factory solution

#### SMART Factory - TIA

**Product/Solution webpage:**

<http://sfactory.sk/>

#### Type of solution:

- Product

#### Smart Factory description:

Currently used production lines are designed to produce a particular product and transforming their production into another type of product is very demanding and financially unprofitable. This fact has the direct consequence of being unable to respond to changes in the market requirements in a sufficiently short time and to a reasonable extent.

The modular production system modifies this situation and provides a tool that can not only provide a prompt response to client requirements, but at the same time manage the production process autonomously and take the necessary measures. For example, automatically replace a malfunctioning module with a new module.

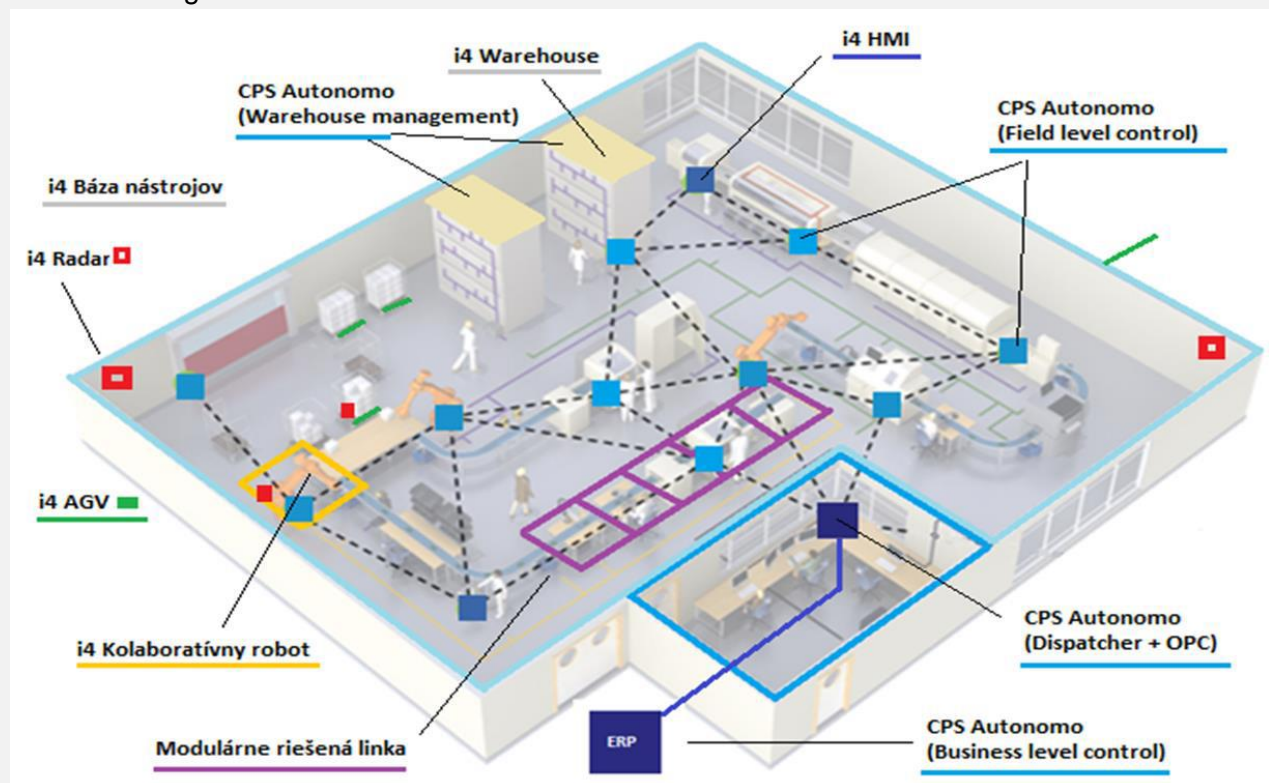


Fig. 10 – SMART Factory - TIA

#### Keywords:

Smart factory, Industry 4.0, IoT, Production management, Autonomous production, Production efficiency, Production variability, Increasing the efficiency of production resources expended, Rapid adaptability of production to customer requirements, Modular production system, Collaborative Robotics

#### Example of Product/Service usage:

Implementation of new technological processes in production systems with the aim of increasing efficiency, introducing modularity, using collaborative robots.

#### 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 maintenance/uptime
- Improved information for business analytics
- Improved remote monitoring capabilities

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

- Implementation in the production processes

**Other relevant information about the product/service:**

Attachment 1: Company logo

Attachment 2: Product presentation: LDW PPT\_MERCHANT,s.r.o..pptx

**Product/service technological focus:**

- Industrial Manufacture
- Plant Design and Maintenance
- Process control and logistics

**Market availability:**

Available on the market since 2019

## 9 eDOCU SMART FACTORY

### Smart Factory solution provider profile

**Organization:**

**eDocu, a.s.**  
Sliačska 1/D, 831 02 Bratislava  
Slovakia

**Website and social media:**

Website: [www.edocu.com](http://www.edocu.com)  
Social media (Facebook): <https://www.facebook.com/eDocu/>  
Social media (Twitter): [https://twitter.com/e\\_docu](https://twitter.com/e_docu)  
Social media (LinkedIn): <https://www.linkedin.com/company/infones-s-r-o-/>  
Social media (Google+):

**Contact details:**

Miroslav Hájek  
Tel: +421 905 888 181  
E-mail: [miroslav.hajek@edocu.com](mailto:miroslav.hajek@edocu.com)

**Type of organization:**

SME

**Market sectors:**

Other – ITC and IoT, Smart Factory Solutions

**Services provided:**

Services (IT)

### Smart Factory solution

**eDocu Smart Factory**

**Product/Solution webpage:**

[www.edocu.com](http://www.edocu.com)

**Type of solution:**

Service

### **Smart Factory description:**

We are introducing an innovative and simple platform called eDocu which is rather unique in terms of its substantiality, accuracy and functioning. It is easy to implement and customize onto your specific requirements. Moreover, the price-performance ratio is invincible.

The platform originates from our vision – linking things with information and is usable for solving various problems a factory might be facing. Thanks to its adaptability on every environment it is highly user friendly and manageable on an intuitive base. One of the biggest perks is that in order to benefit from the platform you do not need to have a special proprietary device, the only thing you need is a smartphone (or device with display) and the Internet connection. Since the whole solution is running on a cloud, the costs are limited. eDocu Smart Factory is the ultimate and widespread solution for every manufacture willing to increase its profits.

This description provides a general overview to the eDocu Smart Factory solutions and consists of the below mentioned products (functionalities). Detailed description of each product (functionality) accompanies the specific (sub)solutions.

### **Keywords:**

eDocu Smart Factory, SaaS, Internet of Things, Maintenance, Facility Management, Occupational Health and Safety, Archive

### **Example of Product/Service usage:**

eDocu Smart Factory is applicable for implementation to every manufacturer and can adapt to every environment where there is ongoing production. The product itself does not matter as the system provides information connectivity of every material thing marked with the iTag (QR, BLE, NFC etc.). The solution is intended for increasing the cost efficiency since it optimises the overall management processes, administration such as archive, training of employees and their consequent certifications, providing an authenticity tool which increases the factory profits and last but not least oversees on the security within the facility.

The solution moreover saves the costs, facilitate the manpower and makes time management more efficient. Moreover, all information is safe, can be proven, linked to a respective thing and between each other.

The solution can be implemented in various ways: (i) Small scale: Implementation of one of the functionalities of a complex Smart Factory service; (ii) Medium scale: Implementation of 2 to 5 functionalities; (iii) Wide scale: Implementation of more than 5 functionalities. The more functionalities factory uses, the cheaper is the service.

### **Improvement areas covered by the Product/Solution:**

Implementation of the novel technology

Implementation of the human resource management systems

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

- Increased speed of production operations
- Increased speed of production operations
- Decreased manufacturing costs
- Improved information for production decisions
- Improved product quality
- Improved coordination with customers
- Improved maintenance/uptime
- Improved information for business analytics
- Improved remote monitoring capabilities
- Improved safety
- Developed visualization capabilities

**Other relevant information about the product/service:**

- Attachment 1: Company logo
- Attachment 2: Product presentation: eDocu\_workshop\_Smart Factory HUB.pptx
- Attachment 3: Product promo material: eDocu\_Smart Factory.pdf

**Product/service technological focus:**

- SOCIAL AND ECONOMICS CONCERNS - Technology, Society and Employment
- PROTECTING MAN AND ENVIRONMENT - Safety

**Market availability:**

Available on market since 2015

## Smart Factory solution

### eDocu Facility Management

**Product/Solution webpage:**

[www.edocu.com](http://www.edocu.com)

**Type of solution:**

Service (SaaS)

**Smart Factory description:**

eDocu Facility management is the system which helps you to manage facility and equipment information. It helps you check important terms, maintenance scale and other requirements. You are able to easily supervise observing your service contracts but also your subcontractors. Your technicians can effectively prepare for inspections and necessary performance on the spot having always the right equipment thanks to a direct and interactive connection of devices in the database. The devices have their iTags (QR, NFC, BLE, GPS) in order to secure the access to

information and documents directly on the spot.

**Keywords:**

Facility Management, SaaS, Internet of Things

**Example of Product/Service usage:**

1. Right after task delivery, a technician disposes with detailed instructions, guidelines, schemes and directives concerning OHS connected with the task.
2. Once the technician is on the spot, he registers himself to the system and maps the current stage before entering into the task. While doing this, he receives the list of problems.
3. The technician creates a work record and uploads photo documentation.
4. The whole process is simplified by digital forms equipped with biometric signature.

**Advantages:**

- Reliable evidence of executed tasks
- Very simple creation of work records
- Decreased risk of fines and penalties
- Effective planning and task management
- Extended life of devices
- Decision making process of technicians based on all relevant information

**Improvement areas covered by the Product/Solution:**

Implementation of the novel technology

Implementation of the human resource management systems

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

Increased speed of production operations

Increased speed of production operations

Decreased manufacturing costs

Improved information for production decisions

Improved information for business analytics

Improved remote monitoring capabilities

**Other relevant information about the product/service:**

Attachment 1: Company logo

Attachment 2: Product presentation: eDocu\_workshop\_Smart Factory HUB.pptx

Attachment 3: Product promo material: eDocu\_Smart Factory.pdf

**Product/service technological focus:**

SOCIAL AND ECONOMICS CONCERNS - Technology, Society and Employment

PROTECTING MAN AND ENVIRONMENT - Safety

**Market availability:**

Available on market since 2015

## Smart Factory solution

### eDocu Maintenance

**Product/Solution webpage:**

[www.edocu.com](http://www.edocu.com)

**Type of solution:**

Service (SaaS)

**Smart Factory description:**

System eDocu is a tool which links things with information and thus supports Total Productive Maintenance (TPM). It brings together maintenance rules, technical data from system SCADA, manuals, checklists, task lists, and activity reports needed to create eTPM (electronic TPM). So why do we do not have to do quick decisions right on the spot. Let's rather do qualified decisions based on relevant and good information and decrease the error costs.

**Keywords:**

eDocu Smart Factory, SaaS, Internet of Things, Maintenance

**Example of Product/Service usage:**

1. SCADA systems sends alarming measurements on the welding machine which happens to be the most important part in manufacturing.
2. eDocu immediately creates a task linked with the responsible person or a group responsible for the proper functioning of the machine.
3. Once the technician comes to the machine, he can immediately start with maintenance since eDocu provides him with the complete history of maintenance on this device and full service documentation as well as notes from other colleagues.
4. The maintenance is shortly successfully done. A work record as well as reminder for the next check are created right on the spot.

**Advantages:**

- Immediate access to relevant information in case of need
- Maintenance records created right on the spot
- Audio-visual records can be easily done and uploaded by a smartphone
- Error decrease during maintenance leads to better productivity

**Improvement areas covered by the Product/Solution:**

Implementation of the novel technology

Implementation of the human resource management systems

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

Increased speed of production operations

Decreased manufacturing costs  
Improved information for production decisions  
Improved product quality  
Improved coordination with customers  
Improved maintenance/uptime  
Improved information for business analytics  
Improved remote monitoring capabilities

**Other relevant information about the product/service:**

Attachment 1: Company logo  
Attachment 2: Product presentation: eDocu\_workshop\_Smart Factory HUB.pptx  
Attachment 3: Product promo material: eDocu\_Smart Factory.pdf

**Product/service technological focus:**

SOCIAL AND ECONOMICS CONCERNS - Technology, Society and Employment  
PROTECTING MAN AND ENVIRONMENT - Safety

**Market availability:**

Available on market since 2015

## Smart Factory solution

### eDocu Occupational Safety and Health (OSH)

**Product/Solution webpage:**

[www.edocu.com](http://www.edocu.com)

**Type of solution:**

Service (SaaS)

**Smart Factory description:**

eDocu OSH will help you to avoid work accidents and accusations of duty neglect and also helps you to obtain an informed consent. We will help you to reduce the number of injuries and improve legal security throughout active cooperation of your employees. Using self-control, an employee verifies whether he is or is not ready to do the task. In our system, you work with active reminders from expirations to revisions through testing and qualification obtaining all the way to first-aid-kit expiration.

**Keywords:**

eDocu Smart Factory, SaaS, Internet of Things, Occupational Health and Safety

**Example of Product/Service usage:**

1. Every employee has its own OSH saved under his personal profile in eDocu.



2. All due dates (e.g. employee retraining) are automatically reminded using email notifications.
3. An employee can log in into the database of classified technical equipment after scanning an iTag, where he finds whether he is or he is not permitted to manipulate with a machine.
4. In case of a work accident, an employee is navigated by eDocu on how to proceed, he is provided with a first aid by the helpdesk and he is able to register the event clearly.

**Advantages:**

- Minimal initial costs and massive savings thanks to cloud solution
- Maximal effectiveness in trainings validity, certifications, decrees or regulations
- Legal assurance in various inspections
- First aid in work accidents (registration, first aid etc.)
- Video training option in eDocu system

**Improvement areas covered by the Product/Solution:**

Implementation of the novel technology  
Implementation of the human resource management systems

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

Improved remote monitoring capabilities  
Improved safety

**Other relevant information about the product/service:**

Attachment1: Company logo  
Attachment 2: Product presentation

**Product/service technological focus:**

SOCIAL AND ECONOMICS CONCERNS - Technology, Society and Employment  
PROTECTING MAN AND ENVIRONMENT - Safety

**Market availability:**

Available on market since 2016

## Smart Factory solution

### eDocu Employee

**Product/Solution webpage:**

[www.edocu.com](http://www.edocu.com)

**Type of solution:**

Service (SaaS)

**Smart Factory description:**

As your employee is the most valuable asset at your company, it is crucial to have right documentation about him. In eDocu, you store all necessary information about your employees. There are records of their practice, skills, certifications, trainings so the manager can immediately recognise whether his subordinate is suitable for the specific task. Just imagine that each employee, even though a candidate, has its own profile with all relevant data. The system automatically notifies you about contract expiration or e.g. need of requalification etc.

**Keywords:**

eDocu Smart Factory, SaaS, Internet of Things

**Example of Product/Service usage:**

1. Company is hiring a new employee and is able to see all his previous jobs, skills and trainings.
2. The system notifies the company a month in advance as the employee is supposed to undertake an OSH training.
3. An employee is given with the company cell phone and PC which are automatically linked to his profile. The company sees the current stage of all bequeathed devices.
4. All work records and skills are summarized in a profile of each employee. This simplifies creation of new teams which are convened in accordance with OSH regulations, qualification or trainings.

**Advantages:**

- Simple and transparent database of employees
- Easily connected with asset or fleet management
- All employees information are recorded – trainings, skills, previous practice, contract, work records
- All information at disposal right on the spot

**Improvement areas covered by the Product/Solution:**

Implementation of the novel technology

Implementation of the human resource management systems

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

Increased speed of production operations

Decreased manufacturing costs  
Improved information for production decisions  
Improved coordination with customers  
Improved remote monitoring capabilities

**Other relevant information about the product/service:**

Attachment1: Company logo  
Attachment 2: Product presentation

**Product/service technological focus:**

SOCIAL AND ECONOMICS CONCERNS - Technology, Society and Employment  
PROTECTING MAN AND ENVIRONMENT - Safety

**Market availability:**

Available on market since 2018

## Smart Factory solution

### eDocu Authenticity

**Product/Solution webpage:**

[www.edocu.com](http://www.edocu.com)

**Type of solution:**

Service (SaaS)

**Smart Factory description:**

With eDocu Authenticity you can very easily protect your product, minimize the risk of falsification and increase your profits. How can the system monitor the authenticity of products? There are many moments where a product falsification can occur from production, through distribution to the end customer. eDocu provides the companies with a simple solution – every product can be marked by iTag (e.g. QR code) and thus prove that your product is original. Providers, retailers and customer therefore have also access to information about your product by simply scanning the iTag. It is not possible to copy so it is easy to learn whether the product is original or a fake.

**Keywords:**

eDocu Smart Factory, SaaS, Internet of Things

**Example of Product/Service usage:**

1. Every product is marked with the unique QR code in time of its production.
2. Once the good is shipped to a purchaser, this event is recorded under the product QR

code and delivery is electronically signed.

3. An end customer has all product information at disposal by scanning the QR code what also increase a value of the product. After its purchase, its status changes to „sold“.
4. In case of QR falsification, the system recognizes a copy and a producer is immediately notified. The option to report a fake product is given to a customer as well in one click way

Advantages:

- Product increase in value – recorded lifelong cycle
- An attractive function for consumers – increase of sell
- Protection and branding development
- Consumer protection against fake purchase

**Improvement areas covered by the Product/Solution:**

Implementation of the novel technology

Implementation of the human resource management systems

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

Improved information for production decisions

Improved product quality

Improved coordination with customers

Improved remote monitoring capabilities

Improved safety

Developed visualization capabilities

**Other relevant information about the product/service:**

Attachment1: Company logo

Attachment 2: Product presentation

**Product/service technological focus:**

SOCIAL AND ECONOMICS CONCERNS - Technology, Society and Employment

PROTECTING MAN AND ENVIRONMENT - Safety

**Market availability:**

Not yet, however there is fit to market and conceptual solution. There is a possibility to customize the product based on the customer's needs.

## Smart Factory solution

**eDocu IoT**

**Product/Solution webpage:**

[www.edocu.com](http://www.edocu.com)

**Type of solution:**

Service (SaaS)

**Smart Factory description:**

Nowadays, more and more companies need information from their machines or devices, right on the spot or remotely. We can monitor many rates or calibrations, e.g. list of malfunction records, temperature sensor, oil supply in the tank or diesel aggregate.

Just come closer to the device marked as BLE (beacon) and all technical information about it will be automatically displayed. Or, place your smartphone onto an NFC chip or scan the QR code and eDocu will bring you information from the system IoT, SCADA or BMS. You do not need a separate application for each type of device, you do not need to come to SCADA terminal or search for sensor in the technological schemes. Information are available via ordinary web environment.

**Keywords:**

eDocu Smart Factory, SaaS, Internet of Things

**Example of Product/Service usage:**

1. User wants to find out the temperature in the drying furnace.
2. The maintainer is next to the machine which does not have a display and he needs to know the malfunction history.
3. Manager needs to remotely find out the devices which need a filter.
4. Operator stands next to the stopped machine and does not know the cause of malfunction.
5. The Manager needs to know the maintenance on the specific device.
6. The maintainer needs to fill in a new compressed air value.

**Advantages:**

- Large touch display is not needed on every device
- No necessity for keeping separate apps for every machine
- No need for application at all – everything works on a smartphone

**Improvement areas covered by the Product/Solution:**

Implementation of the novel technology

Implementation of the human resource management systems

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

Increased speed of production operations

Improved information for production decisions

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: Product presentation: eDocu\_workshop\_Smart Factory HUB.pptx

Attachment 3: Product promo material: eDocu\_Smart Factory.pdf

**Product/service technological focus:**

SOCIAL AND ECONOMICS CONCERNS - Technology, Society and Employment

PROTECTING MAN AND ENVIRONMENT - Safety

**Market availability:**

Available on market since 2018

## Smart Factory solution

### eDocu Archive

**Product/Solution webpage:**

[www.edocu.com](http://www.edocu.com)

**Type of solution:**

Service (SaaS)

**Smart Factory description:**

eDocu Archive is a secure, appropriate and financially reasonable solution for your digital archive. You can manage the whole documentation in a digital archive all the way to a single document level.

All linked information (including work records and comments) are available alongside with other complex overview and searching functions. You can find a specific document in a system and update all information in a physical archive as well.

**Keywords:**

eDocu Smart Factory, SaaS, Internet of Things

**Example of Product/Service usage:**

1. Documentation of a new device is tagged with QR code and scanned. Physical original is stored in the external archive.
2. Document information are acquired by using OCR and uploaded together with scan and location of the original.
3. In case of need to check the documentation, the information is displayed within seconds accompanied by the original scan whilst the system monitors all overviews and changes.
4. In case the device is broken and it is necessary to find a warranty, you are able to locate in eDocu with an information where the original version is stored.

Advantages:

- Decrease of costs – no need to own a physical archive, smaller employees preoccupation
- Increased security
- Various groups of users or third party can access to a different documents upon approval
- Faster access to a document

**Improvement areas covered by the Product/Solution:**

Implementation of the novel technology

Implementation of the human resource management systems

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

Improved information for production decisions

Improved information for business analytics

**Other relevant information about the product/service:**

Attachment 1: Company logo

Attachment 2: Product presentation: eDocu\_workshop\_Smart Factory HUB.pptx

Attachment 3: Product promo material: eDocu\_Smart Factory.pdf

**Product/service technological focus:**

SOCIAL AND ECONOMICS CONCERNS - Technology, Society and Employment

PROTECTING MAN AND ENVIRONMENT - Safety

**Market availability:**

Available on market since 2015



## 10 3DIMENSION SUPPORTED BY MYMEDIA

### Smart Factory solution provider profile

**Organization:**

**3Dimenzia s.r.o.**  
Klincová 35,  
821 08 Bratislava, Slovakia

**Website and social media:**

Website: [www.3dimenzia.sk](http://www.3dimenzia.sk)  
Social media (Facebook):  
Social media (Twitter):  
Social media (LinkedIn):  
Social media (YouTube): <https://youtu.be/upeLb-f6qD0>

**Contact details:**

Peter Svoboda  
Tel. +421 940 859 947  
E-mail: [info@3dimenzia.sk](mailto:info@3dimenzia.sk)

**Type of organization:**

- SME
- R&D

**Market sectors:**

- Construction
- Toys
- Electrical and electronic engineering industries
- Food industry
- Mechanical engineering
- Medical devices
- Automotive industry

**Services provided:**

- Manufacturing
- Research and development
- Engineering
- Services

## Smart Factory solution

### 3D print Quadron

**Product/Solution webpage:**

[www.3dimenzia.sk](http://www.3dimenzia.sk)

**Type of solution:**

Product  
Service

**Smart Factory description:**

3Dimenzia, This Slovak company established in the large-sized 3D printing is entering the market with an innovative concept. One of their product - large 3D printer - has a printing volume of 1 meter cubic and circa 50 kg weigh. The competing 3D printers (with the same size of printing volume) weigh usually 500 kg or more. Naturally, this company has in their portfolio of smaller 3D printers, as well. The whole family of 3D printers is nowadays certificated and ready for selling.

The company is ready to meet the demands of clients in the field of 3D printing on an international scale. One of the fundamental principles of its functioning is a customer-oriented approach to address the individual needs of customers. Each assignment is treated as a unique project, enabling the company to achieve exceptional results supported by the satisfaction of the client.

This company can guarantee not only the functionality of the 3D model, but also places emphasis on aesthetic and attractive design with precise detail. Some examples of 3D printing products are available as a picture attachment of this cooperation profile. To capture a 3D model it is enough to have photography, visualization or a drawing. The team of 3D graphics ensures the quality of sculpted model and prepares it for production so that the resulting product is a perfect miniature of reality.

The typical use of 3D printer is to provide a 3D models of:

- buildings,
- visualizations of various products,
- cars, motorcycles, ships, aeroplanes,
- figures, busts,
- logos or promo materials,
- other 3D models and prototypes.



**Figure: 3D Printer Quadron**



**Figure: Printed 3D models**

Others innovative products of this modern company are interesting. Special carbon material for 3D printers, with very good properties. Developed in cooperation with Slovak Academy of Science and awarded by Ministry of Economy (2nd place in innovative act of 2017).

This company has prototype of building arm in size 1:10. Building arm in real size will be used for building real houses, parts of bigger buildings, etc.

They are making R&D on others product too, like excellent shell for robotic women, etc.

**Keywords:**

3D printing, Construction engineering (design, simulation), Design of Vehicles, Aeronautical technology / Avionics, Creative products

**Example of Product/Service usage:**

Presented 3D printer is suitable e.g. in architecture, automotive industry, aerospace industry, as well as in various fields of art, design, marketing, education, research, healthcare, etc.

**Improvement areas covered by the Product/Solution:**

- Increased speed of production operations
- Decreased manufacturing costs
- Improved product quality
- Developed visualization capabilities
- Improved compliance with customer specs or regulatory requirements

**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: 3Dimenzia\_LDW PPT
- Attachment 3: Video about SF solution (<https://youtu.be/upeLb-f6qD0> )
- Attachment 4: Product promo material: 3Dimension-Leaflet.pdf

**Product/service technological focus:**

- Industrial Biotechnology
- Electronic circuits, components and equipment
- Electronics, Microelectronics
- Aerospace Technology
- Construction Technology
- Creative products
- Industrial Manufacture
- Materials Technology
- Other Industrial Technologies
- Sports and Leisure
- Creative services
- Design and Modelling / Prototypes

**Market availability:**

Already on the market

## 11 INFOTECH - OPEN RTLS (REAL TIME LOCATING SERVICES) PLATFORM

### Smart Factory solution provider profile

**Organization:**

**INFOTECH, s.r.o**

Tematinská 10

851 05 Bratislava, Slovakia

**Website and social media:**

Website: [www.infotech.sk](http://www.infotech.sk)  
[www.rtls.solutions](http://www.rtls.solutions)

**Contact details:**

Michal Ukropec, CEO

0905 668 220

[ukropec@infotech.sk](mailto:ukropec@infotech.sk)

**Type of organization:**

SME

R&D

**Market sectors:**

Automotive industry

Electrical and electronic engineering industries

Food industry

Mechanical engineering

Other

Logistic centres

Warehouses

**Services provided:**

Consulting

Manufacturing

Research and development

Services

Other:

Analysis of logistics and production processes

IoT integration

Mobile apps

Custom hardware and software development

3D printing

## Smart Factory solution

### Open RTLS (realtime locating services) solution

Product/Solution webpage: [www.rtls.solutions](http://www.rtls.solutions)

#### Type of solution:

Product  
Service

#### Smart Factory description:

Open RTLS is a technology set of hardware and software offering indoor location services. It allows to track, optimize and manage processes that were not possible to digitalize before:

- In internal logistics provides generational jump in fleet management of forklifts and tuggers, thanks to integration with IIoT (Industrial Internet of Things)
- Monitoring of the position of a lone worker in dangerous areas allows to apply better safety rules
- Application in facility management offers analysis of utilization of large office buildings, ensures access rights to data centers, integrates attendance systems and adjusts workspace for employees according to their preferences

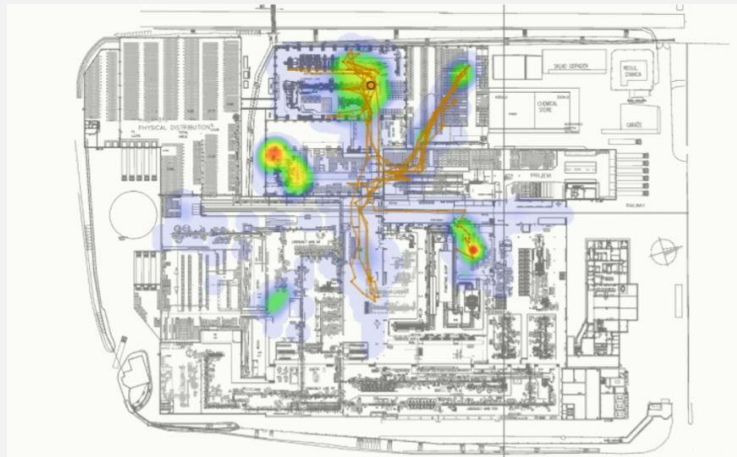
#### Example of Product/Service usage:

Realtime visualization of the fleet

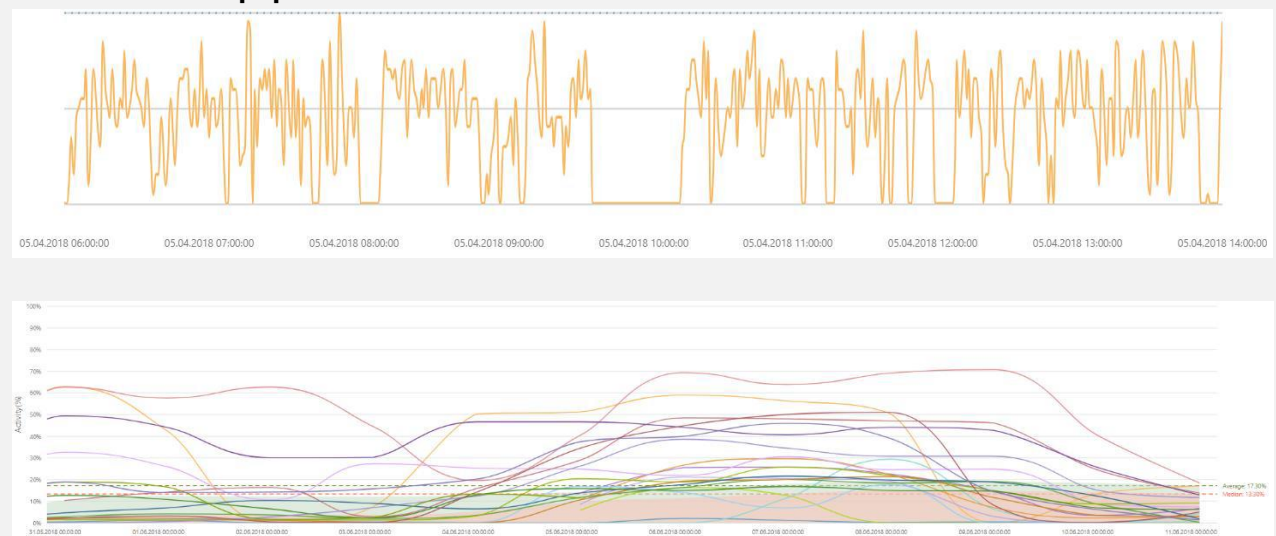




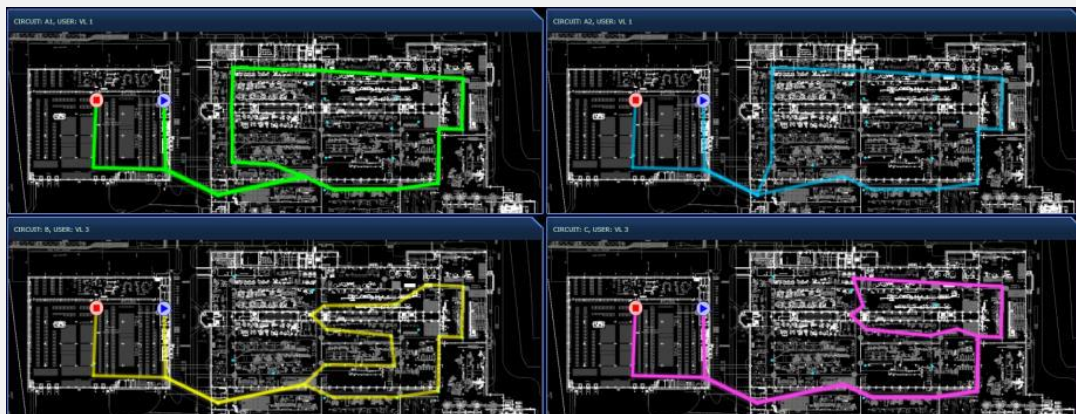
## Reporting – spaghetti charts



## OEE - Overall Equipment Effectiveness



## TV Screens



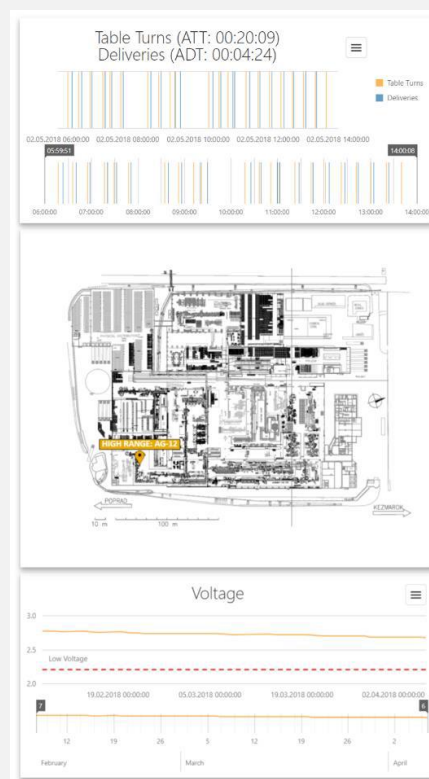




## IoT integration



Prírodná Materka	Materka	Zostávajúci čas	Prírodná Materka	Prírodná Materka
AG-01	TUBS	1:54	VYSOKÁ	DODANÉ
AG-02	MOTORS	2:49	STREDNÁ	DODANÉ
AG-03	TOP COUNTERWEIGHT	4:25	STREDNÁ	DODANÉ
AG-04	CONTROL TABLE	5:49	NÍZKA	DODANÉ
AG-05	DISPLAY	7:15	NÍZKA	DODANÉ
AG-06	PUMP	9:36	NÍZKA	DODANÉ



**Keywords:**

- RTLS - realtime locating services
- Internal logistics
- Lean management
- Asset tracking
- Digital twin
- iBleacon / BLE
- UWB - Ultra Wide Band
- RFID
- Safety
- Lone worker
- 3D visualization
- Process visualization
- Forklift
- Tugger
- IoT - Internet of things
- Smart factory
- Digital factory

**Improvement areas covered by the Product/Solution:**

- Implementation of the novel technology
- Implementation in the production processes
- Implementation of the human resource management systems

**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 maintenance/uptime
- Improved information for business analytics
- Improved remote monitoring capabilities
- Improved safety
- Developed visualization capabilities

**Other relevant information about the product/service:**

Attachment1: Company logo

**Product/service technological focus:**

**ELECTRONICS, IT AND TELECOMMS**

- Information Processing & Systems, Workflow
- IT and Telematics Applications

**ENERGY**

- Energy efficiency

**INDUSTRIAL MANUFACTURING, MATERIAL AND TRANSPORT**

- Industrial Manufacture
- Plant Design and Maintenance
- Process control and logistics
- Traffic, mobility
- Transport and Shipping Technologies

**PROTECTING MAN AND ENVIRONMENT**

- Safety
- Water Management

**SOCIAL AND ECONOMICS CONCERNS**

- Citizens participation
- Creative products
- Infrastructures for social sciences and humanities
- Socio-economic models, economic aspects
- Technology, Society and Employment

**Market availability:**

Available since 2016