

# Case Design Sheet



## 1. CASE DESCRIPTION

Change of paradigm within the Company, manufacture automotive components in conditions of an Industry 4.0 and in condition of a greener and sustainable economy.

The need to introduce advanced technologies, automation and robotics. The necessity to implement cloud technologies and IOT. Identification of complex digital data analysis solutions.

Professional training of specialists at a high level of skills and digital competences for industry 4.0, design and engineering, automation and integrated systems.

<b>PARTNER</b>	<b>LOCATION</b>	<b>TIME/DURATION</b>
COMPA - Member cluster PRELMET	Sibiu, Romania	24 months

## 2. DIGITAL TRANSFORMATION CHALLENGE

### 2.1. BUSINESS TRANSFORMATION

- Development of the R&D department by creating a virtual testing technology (digital simulation) of the manufacturing process.
- Implement industrial robots to relieve human operator from manipulation and repetitive tasks.
- Active control - by measuring all allowances and attributes during the tact of manufacturing line.
- Automatic compensation and operator alerts based on measured values and algorithms implemented for decision making. Feedback to the manufacturing machine.
- Reducing defects and errors produced while handling interoperable products by introducing robots, conveyor belts and automated control stands.
- Human resource development in digital field at the level of experienced users.
- Cyber security.

### 2.2. CONCEPTUAL TRANSFORMATION

- Defining the digital manufacturing process. Identification of: needs, upgrades, equipment, financial and human resources
- Development of human resources in digital competences and innovation, such as:
  - Information processing
  - Analysis and creation of digital content
  - Communication and collaboration based on new digital technologies

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- Troubleshooting complex issues
- Adaptive learning, creativity and analytical thinking
- Cybersecurity
- Additive manufacturing
- Product simulation
- Process design and simulation
- Engineering and service design
- Innovation techniques for products and services

## 2.3. TECHNICAL TRANSFORMATION

- Developing the digitized manufacturing process. Designing the product or product family in CAD. Simulations, prototypes, process tests. Kinematic simulation of robots.
- Execution of products, ensuring the sustainability of the project by capitalizing on the experience accumulated along the implementation of the project. Making the product or family of products within the digital factory. Identifying more manufacturing lines or processes in which digitization could be implemented.

## 3. SOLUTION

- Establish acquisition of equipment and software needed for the digitized line. Machines with high productivity and technological flexibility tools that are compatible with Industry 4.0. Measuring and control devices compatible with Industry 4.0. Integrated check and control stands according to Industry 4.0.
- Development of human resources in digital competences and innovation.

## 4. KEY SKILLS AND COMPETENCES

- Qualified staff in robotics, mechatronics.
- Additional staff specialized in project development.
- Additional staff specialized in research and innovation.

## 5. RESULTS

- Use of advanced production technologies: machines with high productivity, universal, multi spindle and multi axis. These equipment can be fully integrated into the network, allowing unlimited communication with the equipment.

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- Use of robotics to enhance the flexibility of production line.
- Use of CAD – CAM technology in production. CAD/CAM applications are used to both design a product and program manufacturing processes, specifically, CNC machining. CAM software uses the models and assemblies created in CAD software to generate toolpaths that drive machine tools to turn designs into physical parts. CAD/CAM software is used to design and manufacture prototypes, finished parts, and production runs.

## 6. CONCLUSIONS AND RECOMMENDATIONS

- Starting the process of developing the human resources in digital competences and innovation.
- Development of the R&D department with human resources and equipment's. Transfer the know-how from the R&D department in the production lines.

## 7. REFERENCES

- Compa had meetings with representatives of ULB Sibiu for a partnership within the DiFiCIL project - Development of socio-physical-cybernetic systems on the basis of the Works of the Future - ID P-37-771, Contract No. 69 /8.09.2016
- Compa, upgrades the technology infrastructure to prepare for switching to intelligent processes. In this respect, it was started to define a standard Industry 4.0
- Compa invests in collecting process data from the production workshops. Step two is analyzing the collected data. Step Three is optimization, automatic /semi-automatic processes based on the real-time situation of all resources in all production workshops.
- Compa has shown its readiness to provide human resources for making prototypes at universities, research institutions.
- Compa can train a team before implementing Industry 4.0 systems.
- Compa has organized meetings with the IT cluster Cluj to identify the opportunity to launch a Research and Development / Implementation project on Industry 4.0 in Compa SA (eg cloud computing and intelligent resource management, IoT, expanding monitoring facilities production).

## 8. APPENDICES