Case Design Sheet

1. CASE DESCRIPTION

Cobots, as human worker replacement, represents the new challenge for industrial companies. In order to install this type of equipment, automation and programming skills are needed for engineers.
DIGI FoF provide training materials for installing and programming information needed for a rapid implementation of Cobots in industrial environment.

PARTNER	LOCATION	TIME/DURATION
CONTI	Romania, Sibiu	2019.10 - now

2. DIGITAL TRANSFORMATION CHALLENGE

2.1. BUSINESS TRANSFORMATION

Human workforce is replaced by Collaborative Robots, also known as Cobots, in order to achieve operational higher/excellence levels in production processes. They are intended to raise production quality, while increase productivity with minimal costs and reduce manpower requirements.
Workplaces need to be optimized before Cobot implementation, therefore business transformation knowledge is needed with regard of lean manufacturing in order to optimize processes, define annual strategy for production and improve the KPIs.

2.2. CONCEPTUAL TRANSFORMATION

Cobot implementation is part of Digitalization programs that modern industrial companies need to have to comply with Industry 4.0 concept. The program's intended reason is to provide a good understanding of functionality and usage of Cobots in production processes.

2.2. TECHNICAL TRANSFORMATION

Technicians and operators need training to start and stop the operational Cobots. Dedicated specialists are needed for maintenance and (re-)programming activities with specific Cobots skills.
Skills needed for Cobot implementation covers script programming, industrial communication between equipment and interface usage.

3. SOLUTION

Continental Automotive Systems chose UR Cobots to perform task of handling and validating Printed Circuit Boards (PCBs) during manufacturing process that are monotonous and repetitive tasks but requires precision and finesse. Cobots need to be installed, programmed and synchronized with production machines and maintained as a mechanical system.

Case Design Sheet

4. KEY SKILLS AND COMPETENCES

Key skills and competences required to implement the Cobots are:

- Design applications for Cobots with CAD skills
- Installation and mock-up of processes
- Configuration of Cobots to communicate with industrial machines
- Maintenance of Cobots, controllers and interfaces with machines
- Script programming the Cobots
- Test functionality of Cobots
- Design grippers for intended Cobot applications

5. RESULTS

DIGI FoF trainee will be able to follow the Cobot cycle: Design - Integrate - Operate. He/she will understand the forms of Human-Robot Collaboration, understand process Goals, to conceive a design for a Cobot application (by creating specifications, define cell conditions, assess impact with regard of Cell Access, Noise, Visibility, Safety restrictions, Environmental conditions and Budget conditions. After that, will follow the basics of Cobot Selection with regard of Reach, Payload, Cycle Time, Tool requirement. Later will be able to integrate the Cobot with existing production equipment and systems (ex. RFID, MES etc.) using wired /wireless communication. For this is necessary to know the standards (ISO 12100, ISO 13849, ISO 10218). Next step is to optimize the solution taking in consideration Cost Reduction and to Improve Effectiveness.

6. CONCLUSIONS AND RECOMMENDATIONS

Continental Automotive Systems is pleased with the results received after the implementation of Cobots in the production lines, benefits being presented below:

- Control and flexibility: Continental have control over the decisions made by the robot due to simple programming, using electronics and robot controllers in Smart Application Shop (SAS), where specialists make all the programming and simulation inhouse, without the need of extern specialists.
- Reduce effort for operators: Implementation of Cobots simplify the work of operators by performing difficult/special tasks, so they can concentrate on value-adding operations.
- Cost reduction: Automating the work of operators, Continental company reduced it's operating costs by reducing material handling with 30%, compared with manual tasks performed by operators.
- Safety: Safety measures associated with Cobot implementation has improve the workplace security due to additional sensors that stops instantly the Cobot when the operator enters too close in Cobots area to prevent accidents.

Case Design Sheet

7. REFERENCES

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8. APPENDICES

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