Design of PLB projects – Turnatoria Metalul

Module 5: New digital manufacturing technologies. Advanced digital technologies and combination of these in the foundry
Learning Outcomes linked:
Process Improvement through the Management System of the Lean Type – IPSML - Describe the contents and the interactions between specific concepts related to Lean Manufacturing. List the tools the company can use to apply the Lean Manufacturing. - Identify different types of Additive Manufacturing. Explain the 3D Printers and the future of them. - Describe the future of the supply chain and it´s benefits for the companies. - Describe the types of Machine Learning. Enumerate perspectives and current applications of Machine Learning.
Aims of the Activity:
• to develop new digital competences organizing training for engineers • diversify the production with new products, even if the order is for small manufacturing series, increasing the customer portfolio by attracting new customers; • reducing the preparation and implementing times for manufacturing the new products; • reducing duration of pattern design; • diminishing the percentage of defective products.
Duration of the Activity:
Group reflection: 2 hours Individual work 2 hours Team work: 8 hours Total: 12 hours

Introduction
Turnătoria Metalul /Metal Foundry is a company established in 1992, operating on the casting service market. This foundry produces pieces of cast iron, steel, aluminium and other types of foundry alloys. The project consisted in the reorganization of manufacturing preparation and training for workers who will be involved in procceses digitalisation. It is crucial for the management of the company because they have to make attractive the foundry sector for young workers and to develope new digital competences for them. That will be realized organising training for young engineers in order to develope digital competences and by automatisation of the techological proceses. What they gain from this project are knowlede in new digital manufacturing technologies (Lean Type) and the use of problem solving methodology.
Problem
The manager's probleme is how to ensure a successful implementation of the Lean Type management system and how to make attractive the foundry sector ? The foundry sector has to face the lack of (deficiency) skilled work force. More recently, in order to diversify their customer portfolio,they started producing molded parts, on the request of various customers, in relatively small series. The complex configurations of these pieces require extended production preparation implying longer delivery times for the products. For these reasons, they had to reorganize their manufacturing preparation by introducing a new modeling system and purchasing a printer and a 3D scanner. The company has clients who do not have drawings for the required parts, especially those who need spare parts to have certain machines and equipment repaired so that they have to draw a model after that piece. Based on the analysis aimed at meeting customer satisfaction in a relatively short time, they needed to find a way to shorten the manufacturing preparation time. Therefore, the factory intend to purchase a 3D Scanner and a 3D Printer.
Learning objectives
What the manager and young engineers must learn is higher order thinking like analyses, evaluation and the concept understanding.
Resources
- Technical manual for 3D printing and scanner - Videos, websites - Advise of the Technical University in Lean Manufacturing
Product specifications
A work procedure where the manufacturing preparation to introduce a new modeling system is reorganized.

Guiding questions
- Did you find the way for the production diversification? - How could you reduce the preparation and implementation times for manufacturing? - How could you diminish the percentage of defective products?
Assessment exercises
- Answering individually to the guiding questions - Discuss the answers with the team
Time constraints
Group reflection: 2 hours Individual works: 2 hours Team work: 4 sessions x 2 hours = 8 hours Total : 12 hours