Design of a technical facility for the production of slats for the Strada radiator grid

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Bridging programme for Master of Electromechanical Engineering Technology

SITUATION

Currently at Jaga the production of the Strada grid happens in the Czech republic. Unfortunately, this plant will close in the future. The company will use this as an opportunity to automate this fabrication process, instead of doing it by hand like the current situation.

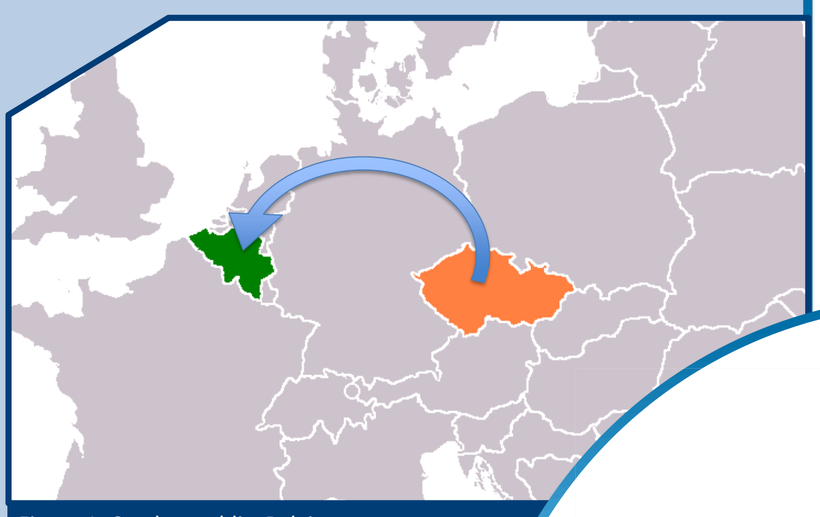


Figure 1: Czech republic, Belgium map

GOALS

The goal of this challenge is to bring in long slats and process them into a semi-finished product to be prepared for the assembly of the overall grid.

- Import 6 m long slats
- Cut to the requested sizes
- Punch holes where necessary
- Set the slats for assembly

The main difficulty of this assignment was the high flexibility of the construction. The grid size van vary between 50 and 280 cm in length.

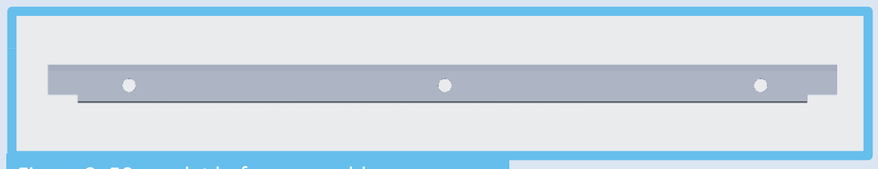
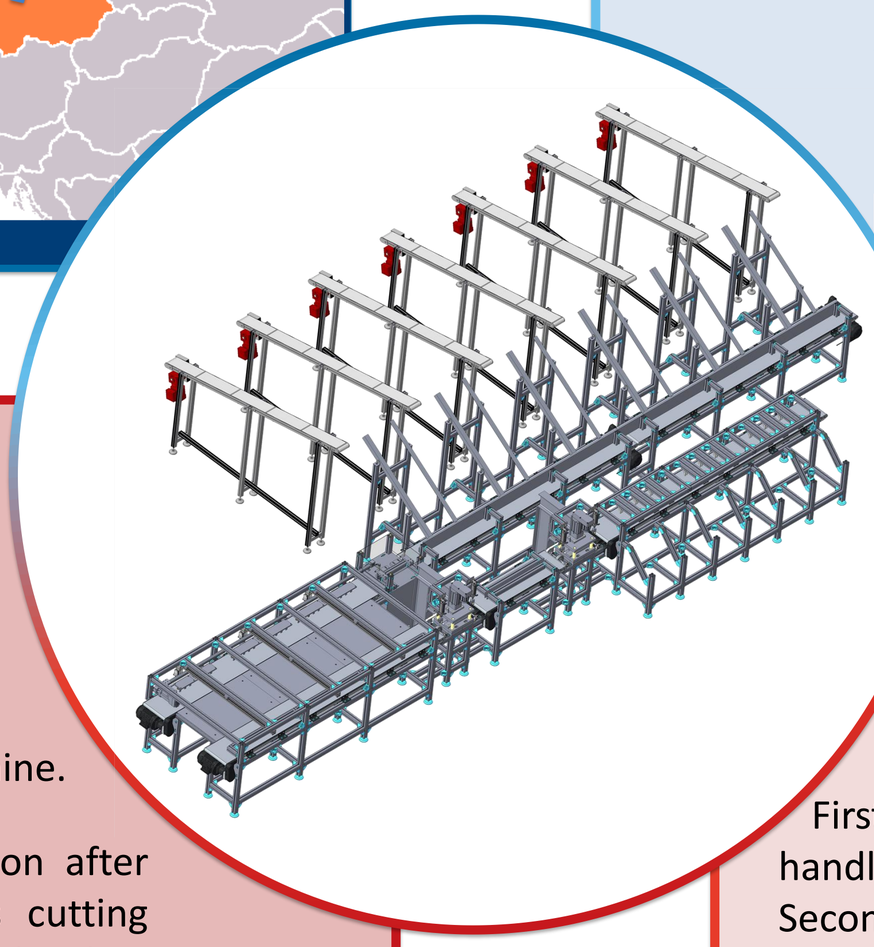


Figure 2: 50 cm slat before assembly



RESULTS

The complete machine is a merge of different steps of the process.
All the different functionalities are combined to make the finished machine.

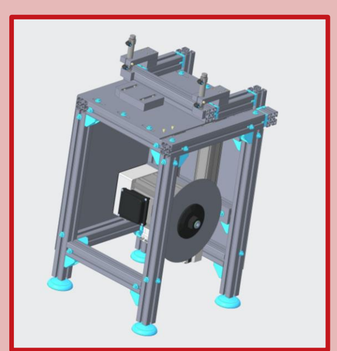


Figure 3: Cutting mechanism

The first operation after the magazine is cutting the slats to length. They will be clamped by pneumatic cylinders and cut by the saw.

Secondly the cut slats will move through the punching machine, first to make the holes needed for assembly.
Afterwards they move to a similar tool to punch the corners of.

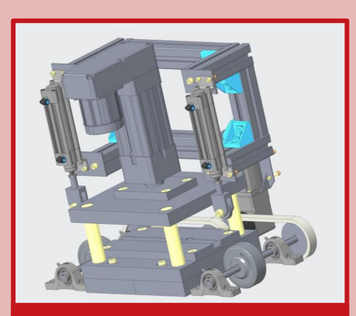


Figure 4: Punching mechanism

After these operations, the slat is ready for assembly in the grid for the radiator.

METHOD

First do some research on existing methods on the handling and manufacturing of slats.
Secondly with the gathered information, we started working on possible concepts to realize the intended results.

Table 1: Morphological overview

Input	Buffer	Positioning	Cutting	Making holes	Output
Palettes	Magazine	Conveyor belt	Circular saw	Drilling	Magazine
	Conveyor belt	Chain with mounting	Band saw	Punching	Manual
			Waterjet cutting	Waterjet cutting	Robot arm

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