TECHNICKÁ UNIVERZITA V LIBERCI
Fakulta strojní

OPPONENT´S ASSESSMENT ON DIPLOMA THESIS

Student´s name and surname: Ravivarman Thirugnanam

Name of the diploma thesis: Optimization of CNC machining Workshop

Supervisor of the thesis: Ing. František Koblasa, Ph.D.

Opponent: Ing. Ondřej Lada

1. Diploma thesis evaluation

Evaluation	excellent	excellent minus	very good	very good minus	good	failed
Meeting the goal and fulfilling task of the thesis		X				
Quality of conducted survey		X				
Methodology of solutions			X			
Expert level of the thesis		X				
Merit of the thesis and its potential applicability of results			X			
Formal and graphic level of the thesis	X					
Student´s personal approach		X				

*Mark **x** in the corresponding box.*
Supervisor's final evaluation is based on his/her overall subjective evaluation.
Grading is stated literally in the article no. 5, neither by a number, nor by a letter.

2. Comments and remarks on diploma thesis:

The first part of the Student thesis introduced the Theory of Lean methods used in Industrial Engineering to analyze and improve on Manufacturing processes. The Student introduced the Theory of Lean methods from basic to more advanced methods like 5S, ABC analyses, Pareto Analyses and others in a compact and transparent form. Each method was accompanied by pictures, schematic diagrams or charts that clearly explain the described method.

I have only one formal comment about the theoretic part. The Student wrote two times "The following picture shows an example of 5S Red Tag holding area" in the chapter 2.4 Ergonomic Rules – General + Assembly.

The theoretic part of the Thesis was overall clearly and easy to read.

The Second Practical part of the Thesis starts with description of optimized CNC Laboratory at Research Center CXI and which Machine Tools contain. Next was introduced the current layout of CNC Laboratory and product portfolio selected from major products for the following analyses. The Student found a typical part with the Pareto Analyses, then he continues with Spaghetti diagram to identify issues in current layout and implement the 5S method on whole CNC Laboratory.

The Practical part of the Thesis is written consistently from description of current state to conclusion and was easy to read. Still I have some comments to this part. I would expect a brief

Unrestricted

introduction of the following analytical steps which would lead to finding a solution. The Table 4 and especially Table 5 deserve more description. I spent some time to understand the content of Table 5. I would like to see some formulas used as example for Table 11 and 13 in chapter 5.2. Multi criteria analysis.

On the other hand, I must highlight the amount of graphic which the Student prepared for this Thesis. All prepared charts, Spaghetti diagrams and Tables helped to easily understand the content. Also, using traffic light colors is a nice way to highlight the Value differences of importance.

At the End of Thesis, the Student summarized the entire optimization approach. In the Conclusion I missed only the recapitulation of selected Variant and the reason why the Variant was selected.

3. Questions about diploma thesis:

Why did the Student mark the Value of "Inventory for finished products in Area m^2" as RED in the Table 10: Criteria Comparison in Chapter 5.2?

What source material did the Student use to estimate the overall expenses for the new Layout?

From the "Analysis of Flow" chapter 3.6.1 the position of EMCO Machine caused the most crossing of material flow. To change position of big Machines like MAZAK or HERMLE is complicated and expensive. Why was there no proposed Variant for changing the position only for EMCO Machine?

4. Opponent´s statement whether the diploma thesis meets the academic title requirements and whether it is recommended for defense:

This Thesis is of a High Quality. The Author understands the Lean Method topic and I see a lot of work has been put into this Thesis.
I recommend this Thesis for defense.

5. Opponent´s grading:

Excellent

Date ... 14.06.2020 ...., in Praha

.... Ondřej Lada ....
Opponent's signature

Unrestricted