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EMPLOYNG REWORKING AREAS TO REDUCE THE COST

BY

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Abstract. The purpose of this paper is to demonstrate the difference between the ways in which technology can be used to reduce manufacturing time, increasing quality and productivity at the same time. All this has results in a saving of energy, labor and resources in general.

Keywords: productivity, manufacturing, quality, rework areas.

1. Introduction

The technological transformations that have taken place in the last hundred years have generated an unprecedented change in the evolution of society.

From the darkness of gas lamps, to the enormous neon lights of advertising installations, to holograms that makes possible the materialisation of mythical creatures, all just a click away.

In this context, not only has technology had to catch up with the leap of constant evolution, but its users have been forced to integrate the changes that have taken place on the fly.

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If we consider that the electric printing press, patented by Thomas Edison in 1872, uses the same keyboard as modern computers, then we can conclude that we are constantly witnessing technological progress that spans generations.

This revolution has marked all areas of human activity, from the car manufacturing industry, through the chain of suppliers involved in the process, to the aerospace industry which has enabled remotely operated equipment to be sent to planets in our solar system, capable of making decisions without human intervention, and the attempt to improve the quality of human life through major changes to medical, environmental and education systems, where online courses have enabled us to continue our lives, even in the midst of pandemics.

2. Technology evolution

The rapid change of the last hundred years has also had an impact on the way we interact with each other, be it acquaintances or even family.

Computers, with their computing power, are an intense driver of change and evolution.

Two generations ago, there were no ATM's, no patient scanning machines, and PCs were mostly the size of a smaller room.

If we only take into account the size reduction of the latter, and add the reduction in manufacturing cost, we see that the influence in our society is and will be increasing.

There will be no process that does not involve interaction with such technology (Le Senechal *et al*., 2017).

In this context, where technological developments have been integrated into production equipment, many processes have become accessible, leading on the one hand to a decrease in manufacturing time, and on the other hand to an increase in production speed (Lim *et al*., 2011)

3. Rework areas in CATIA VR19

In this paper we are using Catia V5R19 for advance machining to make the machining programs for this complex part.

Like we can see in the picture bellow Fig. 1, instead to rework all the rest of material that are posing the problem, for the next machining operations, we are machining only some areas that are identify by the machining software like reworking areas.

This operation is saving more than half of the machining time that can be used for a normal machining operation.

For the first reworking operation we are using a milling tool with the diameter of 6 mm, and the following machining parameters: Feed during the

machining is 1500 mm/min, Feed during the retract and approach of the tool is 1000 mm/min, Speed is 12000 rot/min, and a cutting depth of 0.3 mm.

The machining time is 12 minutes.

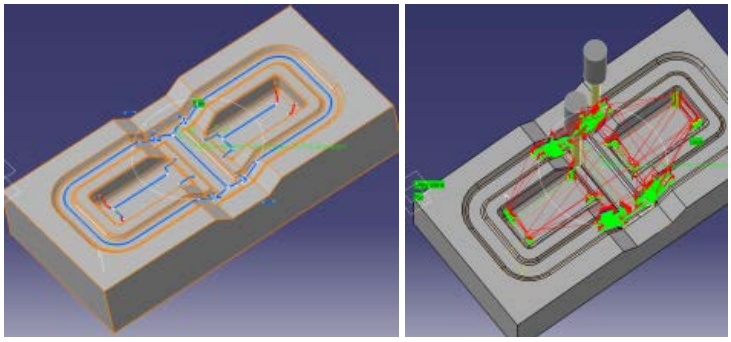


Fig. 1 – Rework area 1.

For the second reworking operation, Fig. 2, we are using a milling tool with the diameter of 4 mm, and the following machining parameters:

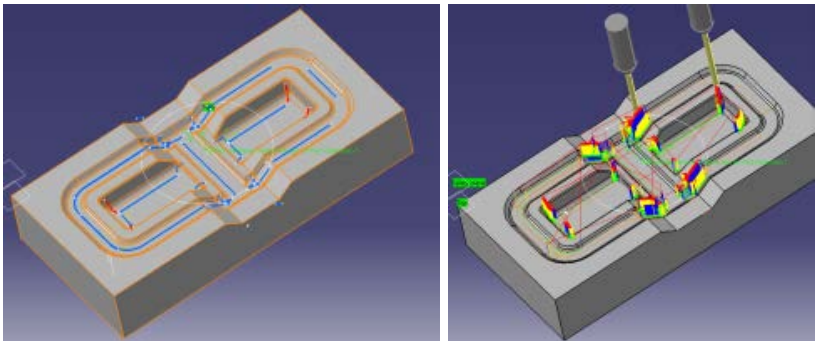


Fig. 2 – Rework area 2.

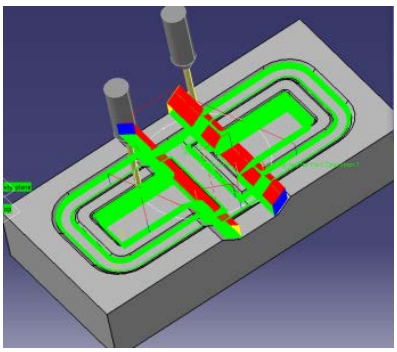


Fig. 3 – Normal machining operation.

Feed during the machining is 1500 mm/min, Feed during the retract and approach of the tool is 1000 mm/min, Speed is 12000 rot/min, and a cutting depth of 0.3 mm (Zivanovic *et al*., 2017).

The machining time is 12 minutes.

The same result, but using a normal machining operation with the same machining parameters, is 47 minutes.

In Fig. 3, is presented a normal machining operation, which means that even if some areas don't need to be machined, the tool ill pas, and it will consume some time machine for doing nothing.

4. Conclusions

In this paper we tried to demonstrate that the simulation process can be useful in machining process. This simulation allow to the companies to save production time, by overlapping the times when the machine tools are working, and the CNC programs allow simulations, analyses can be made that lead to optimizations of the production processes, without the machine tools wasting time with these optimizations.

Also, because of the increasing demand of different products, the pressure to the manufacturing process is increasing.

The solution for this problem could be reworking areas to reduce the costs.

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UTILIZAREA ZONELOR DE REPRELUCRARE PENTRU A REDUCE COSTURILE

(Rezumat)

Scopul acestei lucrări este de a demonstra diferența dintre modurile în care tehnologia poate fi utilizată pentru a reduce timpul de producție, crescând în același timp calitatea și productivitatea. Toate acestea au ca rezultat o economie de energie, de muncă și de resurse în general.