



An Innovative Cost Modelling System Development for Laser Drilling Process

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1. Motivation

Manufacturing industries are continuously striving to enhance their competitive position through improved productivity and quality at minimum possible cost. At this purpose the research project is intended to develop a cost model for laser drilling process due to its wide application in aerospace sector. Laser drilling is a fast-hole drilling technique used to produce holes in gas turbine and aeroengine components.

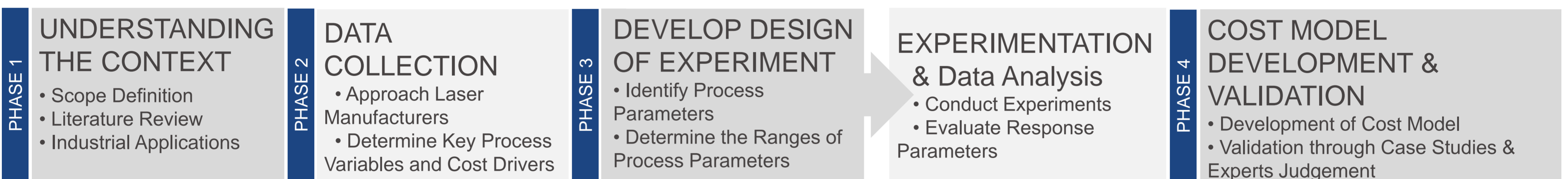
2. Aim & Objectives

The aim of this research is to develop a cost model for laser drilling process taking into consideration the process capabilities.

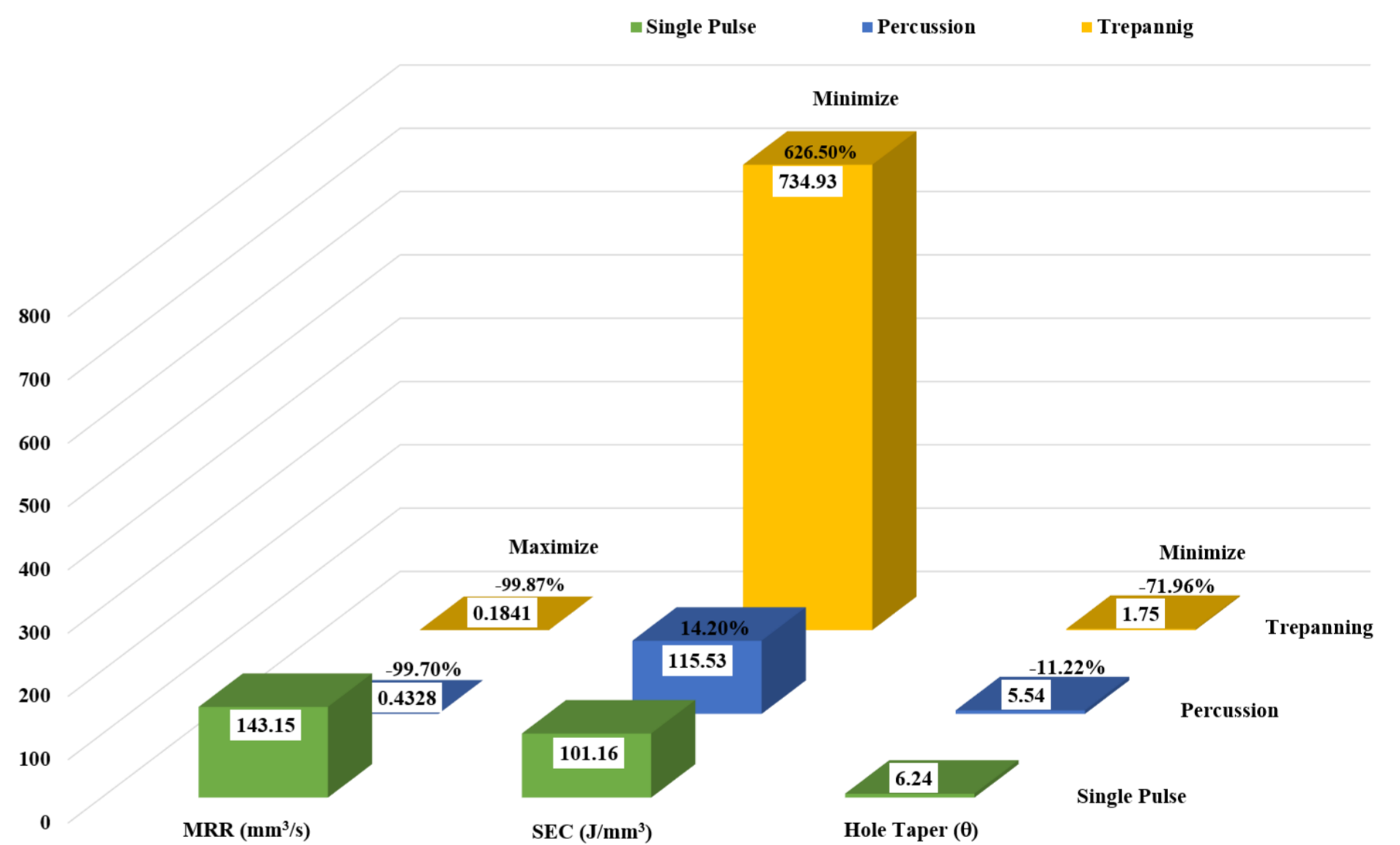
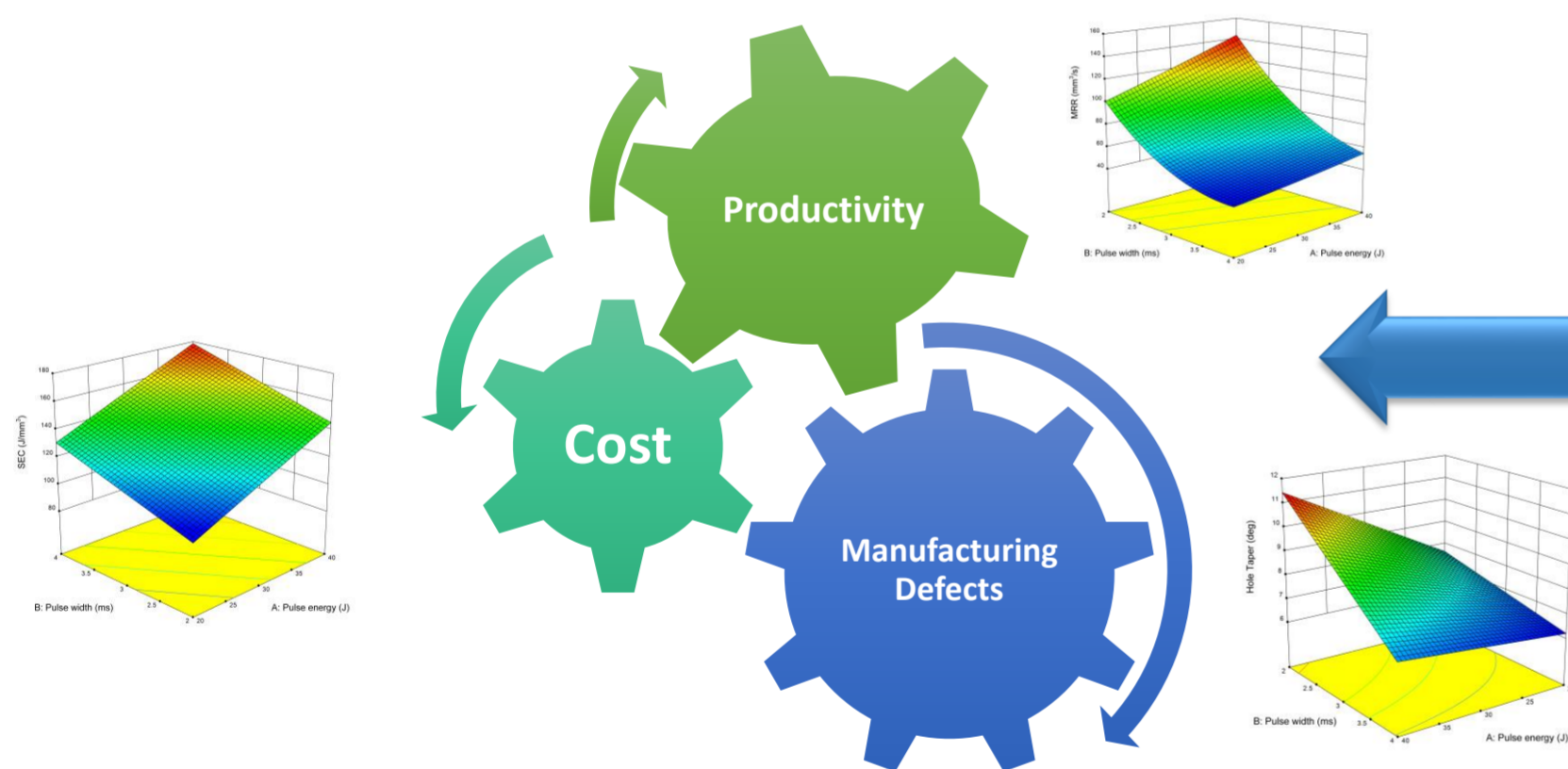
Main objectives are to:

- Identify the key process variables of laser drilling process
- Determine the critical parameters which act as key cost drivers
- Optimise the efficiency of process in terms of productivity, operating cost and quality
- Develop and validate the cost estimation system by means of industrial case studies and experts judgment

3. Methodology

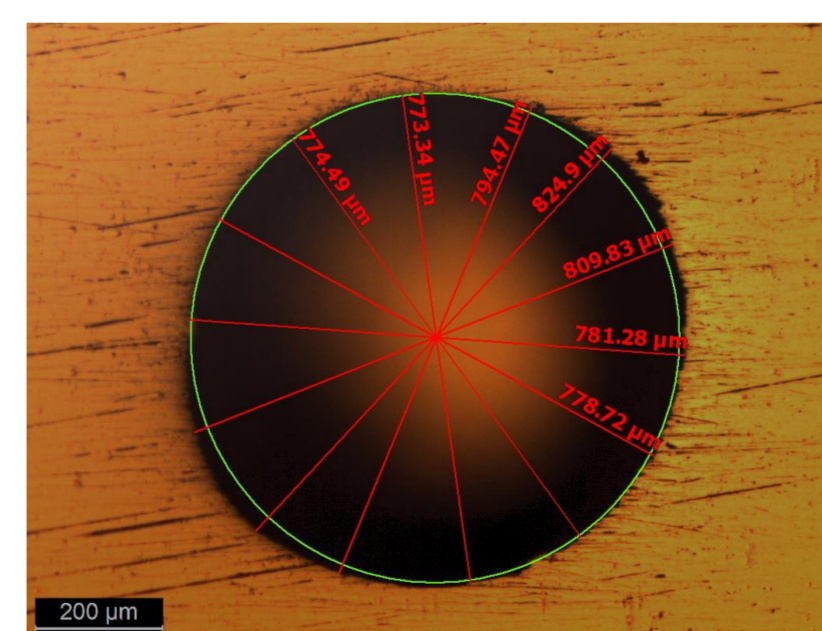


4. Results



5. Conclusions

- Productivity, cost and quality are the key factors for high value manufacturing industries.
- Higher hole quality is achieved in trepanning but at the expense of energy consumption (cost).
- Higher productivity can be achieved with single pulse drilling but at the expense of hole quality
- Pulse energy, NOP/hole and pulse frequency are the main drivers for energy consumption (cost) in single pulse, percussion and trepanning drilling respectively
- Pulse width, NOP/hole and pulse energy are the main drivers for hole taper in single pulse, percussion and trepanning drilling respectively



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2019

