

Annex 17

NMITE

Employer Shaped Modern Engineering Provision



NMITE Manufacturing Systems Optimisation Case Study



NEW MODEL INSTITUTE FOR TECHNOLOGY & ENGINEERING

NMITE's 'Manufacturing Systems Optimisation' module aims to equip students with the skills and knowledge necessary to identify and implement improvements in a manufacturing environment. By integrating their pre-existing engineering expertise with the additional learning acquired in the module, students are empowered to utilise manufacturing optimisation and change management tools to generate enhancements that cover various factors. These factors include social responsibility, sustainability, employee safety and well-being, as well as business success. Moreover, the module offers students the valuable opportunity to cultivate professional behaviours by immersing themselves in on-site visits to a manufacturing facility, where they actively engage with industry processes as integral members of their respective teams. This case study focuses on the collaborative efforts of students and industrial partners within this module, highlighting the practical application of their learning and the mutually beneficial outcomes achieved.

Placed firmly within the manufacturing industry, the module focuses on addressing challenges faced by businesses to optimise their systems and processes to achieve a more efficient workflow. Manufacturing as a sector makes up for around 10% of the UK's GDP and as such an important industry, streamlining operations proves more and more vital as customer demands and labour costs increase. Reducing costs through a carefully change managed, system optimisation could help the business retain their competitive edge. For the module, we worked alongside AK Industries (AKI), a design and injection moulding company based in Hereford.

The students undertaking the Manufacturing Systems Optimisation module were presented with a challenge by Sam Green, the Managing Director of AKI, to suggest improvement to the tool changeover process for an injection moulding machine within their factory. The existing procedure

was marred by inefficient, repetitive, manual labour and consequential production delays. With a focus on both efficiency and employee well-being, the students embarked on a mission to leverage the available resources at AKI and implement quantifiable improvements to the tool changeover process. Their objective was to enhance operational efficiency utilising the tools made available to them through the module. By addressing this problem, the students aimed to drive sustainable improvements in operational performance and contribute to the continued success of AKI in the highly competitive manufacturing landscape.

NMITE learners undertook a thorough analysis of the existing tool changeover process for the injection moulding machine. They closely observed the entire process, identified bottlenecks, and conducted in-depth studies on the machine's downtime. Utilising a range of improvement methodologies, our students identified and presented to Sam Green the potential for up to a 77% enhancement in efficiency with a moderate investment. They also highlighted time savings of 20% to 30% without requiring additional investment. It is important to note that these proposed changes were not limited by commercial constraints. Additionally, they devised a meticulously planned change management procedure to ensure a seamless transition to the new and improved operation. This holistic approach aimed to optimise efficiency, reduce downtime, and prioritise a smooth implementation process.

Through working alongside AKI, our students learned valuable lessons surrounding the significance of thorough analysis of any problems, but also specifically when looking at systems optimisation. They realised the importance of taking a people-centric approach to making major change within processes whilst improving on the technical aspects of the existing process through speaking to AKI staff. AKI allowing our students on-site gave them the holistic context required to provide valuable solutions more effectively to AKI. These collaborations serve as a reminder of the on-going nature of improvement and will equip our students with the knowledge and skills to apply in their careers.

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