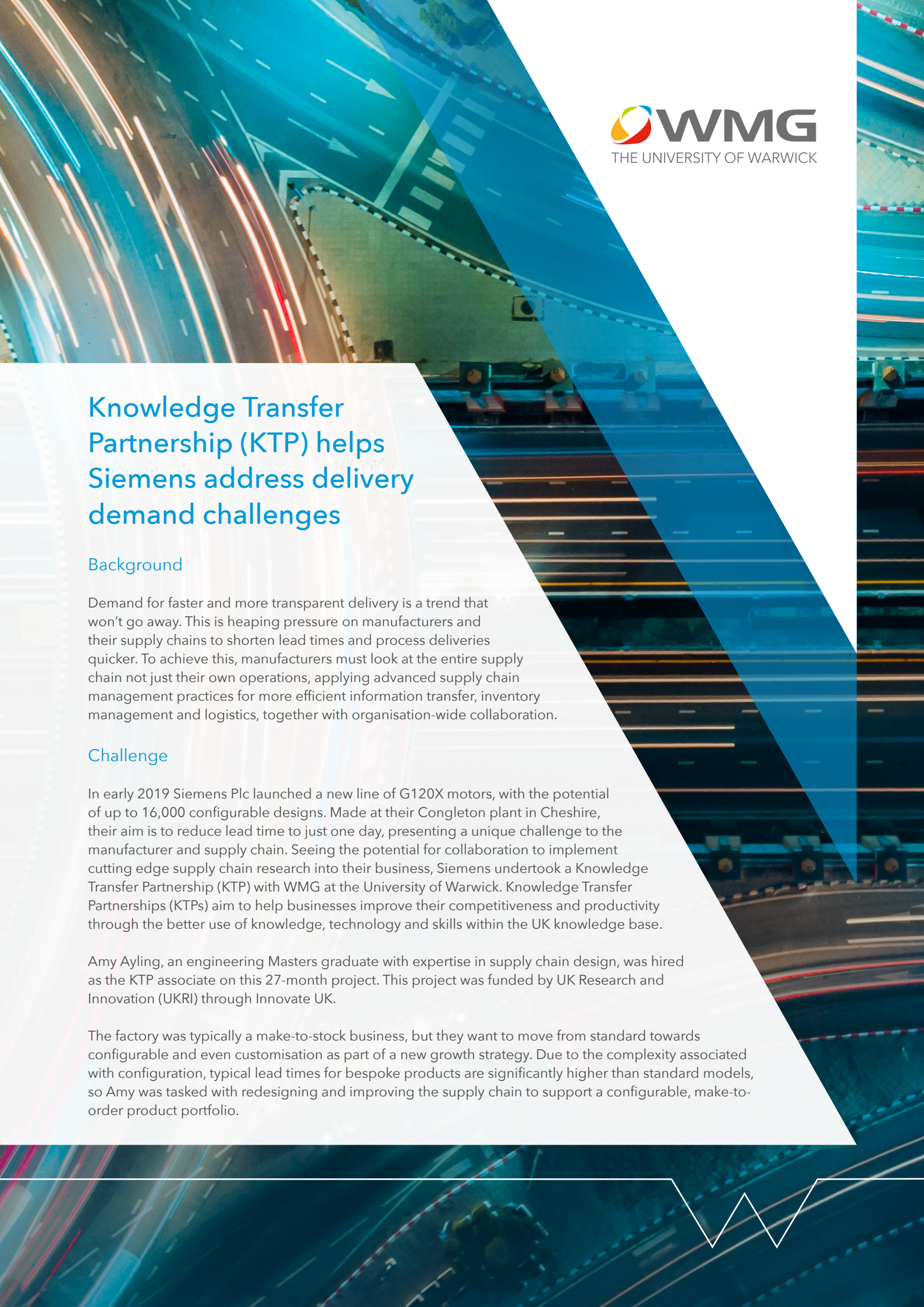

WMG
THE UNIVERSITY OF WARWICK

Knowledge Transfer Partnership (KTP) helps Siemens address delivery demand challenges

Background

Demand for faster and more transparent delivery is a trend that won't go away. This is heaping pressure on manufacturers and their supply chains to shorten lead times and process deliveries quicker. To achieve this, manufacturers must look at the entire supply chain not just their own operations, applying advanced supply chain management practices for more efficient information transfer, inventory management and logistics, together with organisation-wide collaboration.

Challenge

In early 2019 Siemens Plc launched a new line of G120X motors, with the potential of up to 16,000 configurable designs. Made at their Congleton plant in Cheshire, their aim is to reduce lead time to just one day, presenting a unique challenge to the manufacturer and supply chain. Seeing the potential for collaboration to implement cutting edge supply chain research into their business, Siemens undertook a Knowledge Transfer Partnership (KTP) with WMG at the University of Warwick. Knowledge Transfer Partnerships (KTPs) aim to help businesses improve their competitiveness and productivity through the better use of knowledge, technology and skills within the UK knowledge base.

Amy Ayling, an engineering Masters graduate with expertise in supply chain design, was hired as the KTP associate on this 27-month project. This project was funded by UK Research and Innovation (UKRI) through Innovate UK.

The factory was typically a make-to-stock business, but they want to move from standard towards configurable and even customisation as part of a new growth strategy. Due to the complexity associated with configuration, typical lead times for bespoke products are significantly higher than standard models, so Amy was tasked with redesigning and improving the supply chain to support a configurable, make-to-order product portfolio.

Solution

Embedded in the organisation and supported by academic colleagues in WMG's Supply Chain Research Group, Amy started by profiling the current supply chain and designing a vision of what it could look like.

This involved mapping out the entire supply chain end-to-end to understand where improvements could be made. Amy was also able to generate a Bill of Materials (BOM) explosion view, a vital requirement in understanding all the elements that go into the final product.

"This holistic map of the supply chain is a powerful tool, because it shows how everything is interrelated," Amy explains. "It's an ecosystem and by presenting this in a visual way we were able to not only support decision making at the highest levels of the organisation, but also get more staff buy-in to what we are trying to achieve."

In order to achieve the new make-to-order objective, in collaboration with WMG's Professor Jan Godsell and Dr Kate Bailey from Curium Solutions Ltd, Amy built complex models to profile demand and help with stock decisions and allocating buffer capacity to cope with spikes in demand.

Professor Godsell explains: "Supply chain theory needs to be adapted to work in practice. This was a great example of how leading techniques around demand profiling were adapted to support a solution within the Siemens Congleton context. The use of modelling was vital in demonstrating how the proposed solution could work in practice before it was adopted."

One of the greatest challenges in this project was how customisable the product was, with around 16,000 potential different variations possible. As well as the BOM explosion report, Amy carried out a commonality analysis, to identify variations with common components and put these into clusters of similar products. This enables the factory to be alerted or warned when rare customisations are ordered, triggering a response up and down the supply chain.

Impact

By combining standard supply chain practices with new, innovative ones, Amy was able to design a hybrid supply chain solution that would allow Siemens to achieve their make-to-order product portfolio and move closer to their one-day delivery goals.

Amy's recommendations include introducing an availability slot system, enabling smaller frame sizes to shorten order management lead times. In addition, the KTP identified inventory as a critical tool to alleviate pressure on capacity in times of high demand, so further knowledge transfer will be pivotal in realigning business stocking decisions and KPIs with optimal set ups of inventory and capacity. Finally, the model highlighted the significant benefits of postponement (holding an almost finished product based on demand), and this will now be introduced in the business.

Amy has been able to demonstrate what capacity and inventory set ups would be required to establish on-time delivery performance of 98% to both one- and three-day lead times. Other outcomes of the KTP project have been savings made as a result of analysing the BOM explosion report, which allowed the management team to identify savings of around £2,000 already.

Josephine Nelson, Transformation Lead – E2E Supply Chain said: "As newcomers to the KTP concepts utilising the KTP collaboration has given us the confidence to invest in new supply chain practices; the benefit of the KTP has been having Amy embedded in the organisation to understand our challenges, develop solutions, and has enabled effective knowledge transfer, applying the latest thinking and innovative practices from academia."

Dr Russ Bromley, Knowledge Transfer Adviser for this project said, "I am in awe of the commitment of Amy Ayling the KTP Associate for this project for her determination to understand the complexity of the supply chain and manufacturing systems associated with moving from Siemens' existing make-to-stock, to a make-to-order possibility. The KTP has been transformative to the company's manufacturing capability and it will bring future commercial benefits."

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