

## Revealing the benefits of closer supply-chain relationships



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The T-REX project is sending outdated business practices the way of the dinosaurs by showing how closer cooperation between manufacturers and their clients can save resources and boost productivity. Up to 50% gains have been achieved thanks to real-time equipment performance-monitoring implemented by a Spanish project partner.

To compete in today's tough market, manufacturers realise they need to look beyond the 'make things and sell them' business model. While large companies can afford to invest in new approaches, SMEs often see them as daunting – the potential benefits are uncertain and implementation seems too complex. This is why the T-REX [2] project is developing tools to help SME supply chains adopt new manufacturing practices that reduce the lifecycle costs of capital equipment.

Project coordinator Aitor Arnaiz of the Spanish research organisation IK4-TEKNIKER explains: "Business needs to go beyond traditional product sales towards models based on services. In this new landscape, manufacturers do not sell a physical product, such as a machine tool, but rather the benefits it brings, for example a certain performance or outcome."

### Lifting performance

A key element in this effort is the move towards condition-based equipment maintenance that uses sensors to track performance in real time and thus improve productivity. The project has already implemented condition-based monitoring of forklift trucks for a Spanish partner, leading to lower costs and longer equipment lifetimes – up to 50% in some cases. T-REX is also refining new business models to help SMEs adopt integrated product-service solutions (PSS) that reduce waste and boost performance for both themselves and their customers.

“This is a move away from a one-off sale, such as a forklift truck, towards a more integrated manufacturer-customer relationship where the product could be the distance travelled, or the number of goods transported,” says Arnaiz. “T-REX is lowering the barriers that SMEs face to adopting these ideas and benefiting from the productivity gains they offer.”

## **New maintenance models**

The partners are working in two directions. The first is helping SME equipment-makers visualise how PSS might be applied in their particular situation. The second is helping them re-engineer their services and products to match new PSS business scenarios, and demonstrating real benefits in a real manufacturing environment.

“Reducing the life-cycle cost of a machine requires better performance through combinations of repair, renovation and reuse,” explains Arnaiz. “Key to this are new models for machine maintenance which move away from inefficient corrective and preventative approaches. T-REX is demonstrating the predictive benefits of condition-based maintenance which relies on a variety of sensors to monitor critical performance factors.

## **Demonstrating benefits**

The Italian SME partner IMA TECNO s.r.l. has re-designed the high-speed electro-spindle that it manufactures and installed sensor systems that monitor parameters related to reliability and maintenance. By monitoring factors such as spindle wear and failures, the SME is showing how its customers’ production losses can be reduced while providing important feedback for the design of better electro-spindles.

In Spain, T-REX partner ULMA Servicios de Manutencion – sells, rents or leases forklift trucks for goods handling and is benefiting from the project’s new add-on (sensor). The device tracks the performance and condition of the trucks – for example, battery charge and engine performance – and provides this information in real time. It is helping ULMA and its customers lower maintenance costs and extend lifetimes appreciably.

“Our work is helping SMEs visualise the opportunities a PSS approach can offer them; giving them the confidence to go ahead and adopt change. We are already disseminating our results,” says Arnaiz, who is confident that T-REX will achieve its aims of being able to improve component re-use and lower life-cycle costs by 25%-30%.

## **New IMA TECNO s.r.l. electro-spindle designed under reliability driven concept**



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## New ULMA condition-monitoring datalogger



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