Mapping the future

Technology roadmaps have become an integral part of the business arsenal, but what guarantees their greatest impact? Tiphanie Mellor explains how the PowdermatriX Faraday Partnership is helping the particulate engineering industry to realise the potential of this potent and practical tool.

Photo courtesy Deloro Stellite UK Ltd

Like any map, technology roadmaps help travellers to identify the best route to reach their destination. The key difference, though, is that cartographers aren't usually called on to define these destinations, locate landmarks as they see fit, and then schedule the journey itself. If technology roadmaps are to identify and develop successful development pathways, a variety of skills and perspectives must be added to the map-making mix.

According to PowdermatriX Manager Stuart MacLachlan, coordinating the diverse experiences and expertise that inform the process is, 'A matter of taking a structured approach. We use a proven mechanism to forecast technology developments and provide a framework for future plans.'

Last year, PowdermatriX leveraged its familiarity with the technological terrain, and the concerns and capabilities of its members, to lead teams building technology roadmaps for four main sectors – advanced ceramics, hard metals, powder metals and magnetics. 'These roadmaps have established priorities enabling us to align research to business drivers,' explains Dr Michael Hicks, Chairman of the PowdermatriX Research Committee and Chief Materials Technologist at Rolls Royce plc. 'Initially, those new to the concept found it difficult to maintain a coherent focus as these are fairly diffuse sectors. Our technology translators were able to facilitate the process, gain consensus on challenges and opportunities and tease out priorities.'

Following a robust series of consultation activities involving industrial and academic stakeholders, final and validated roadmaps were produced. While the process resulted in a common vision articulated in a common language, there was no guarantee that acceptance would lead to action. An organisation like PowdermatriX is in a good position though, to harness its connections and the critical mass created by the exercise to make things happen. 'Some powerful messages emerged from the roadmaps about generic needs and the difficulties for individual companies of finding the resources to do the necessary research themselves,' says Hicks. 'When a number of organisations came up with the same needs we were able to put partnerships together which engaged even the smallest companies in valuable research.'

Niche opportunities

PowdermatriX has connected many of these projects to Government and EU priorities and programmes. A potential niche opportunity originating from the magnetics sector roadmap, for example, prompted PowdermatriX to respond to

calls from the DTI Technology Programme for environmentally-friendly transport research. The DTI proposal has since been converted into a project that could give the UK sector a lead in producing efficient magnetic material for electricity generation on board aircraft.

Recommendations from all the sector roadmaps have encouraged PowdermatriX to extend its existing activities, as well as the range of information it provides, for members on state-of-the-art technologies. This has included coordinating the recently reported DTI Global Watch mission, which evaluated nanoparticle advances in Finland, Germany and Switzerland.

Company roadmaps

'The sector roadmaps now underpin all our activities,' says MacLachlan. 'They are helping us focus on what we should be doing both from a technological point of view and also to deliver what our members want.' This latter focus has, in fact, led to the launch of a technology roadmapping service for individual companies. 'Members come to us when they recognise that they are in a process of change,' says John Cotton, one of six technology translators who facilitate the bespoke roadmapping service. 'This might be change they want to institute in the way they do business in response to technology needs, or change forced on them by new legislation or market conditions.'

Two factors led Precision Magnetics Ltd to take PowdermatriX up on its offer. This Rotherham-based manufacturer of rare earth magnet systems was not only having to develop value-added activities in the face of cheaper Chinese magnets, it also saw an opportunity to take information gained from Yorkshire Forward's Competitive Edge programme to a new set of customers. 'We knew about the markets we already supply but not about others so we wanted to tap into PowdermatriX's cross-industry insight,' says Technical Manager Roger Allcock. 'It also helped us enormously that the technology translator who drove the project, Charles King, is a magnetics specialist who understood our business.'

Timetable

King spent a day with the company, looking at the technological, economic, regulatory and environmental issues driving the business, exploring opportunities and options, and asking questions. What issues do you need to be involved with? What do you need to be able to do? When do you need to be able to do things by?

'Tying things down to a timeline can be difficult, but once it is done it fixes the horizon, giving the discipline needed to ensure the roadmap delivers,' says Cotton. Once the technology translator had delivered the roadmap, setting a timetable against key activities and milestones, Precision Magnetics was confident that it had taken the right route.

The plan outlined four key actions –

- An investigation into future materials access.
- The development of their apprenticeship scheme.
- The production of case studies showcasing advanced solutions.
- The establishment of a new materials research project which could lead to valuable IPR.

This project involves two universities suggested by King and exemplifies one of the advantages of working with PowdermatriX. 'The most cost-effective intervention we can make is to say, "I know someone who can help with that",' explains Cotton. 'It means the plan starts to develop as the roadmap is being drawn up.'

High precision magnetic rotor assembly for a Permanent Magnet DC (PMDC) motor from Precision Magnetics Ltd

One of the most surprising outcomes, according to Allcock, was the prominence of human resources issues. 'It is obvious that having the right people with the right skills available at the right time will be vital if we are to get where we want to be in five years time,' he says. 'But it's not something I would have expected to come out of the exercise.'

Dr Danie de Wet of Deloro Stellite UK Ltd, which produces wear-resistant alloys, benefited from an equally unexpected outcome of technology roadmaps. 'I saw technology roadmapping as an opportunity to re-focus an existing initiative to develop our UK manufactured cobalt powder business,' he says. 'PowdermatriX came in from outside with an open mind and challenged some of our concepts, which you need when you've been in a market for a while. It became clear that the initiative should become part of a larger global corporate strategy.'

Revisit, review, revise

The one thing PowdermatriX would encourage companies to do is revisit their roadmap. 'The key success factor is to refer to it regularly, review progress against it and revise it when necessary,' says Hicks. 'In this way it will become the dynamic, living document it is meant to be.'

PowdermatriX Faraday Partnership

PowdermatriX was established in 2002 to develop a partnership between industry and the research base in the UK particulate engineering sector, and promote competitiveness and innovation through collaboration and effective communication. Membership services available to its 150 industrial company members include –

- Technology roadmapping.
- Interest and awareness meetings.
- Collaborative research projects.
- Technical advice.
- Support with proposal preparation and sourcing funding.
- Newsletters, e-alerts and web pages.
- Technology brokerage.
- Influence over the PowdermatriX research and training strategy.

Further information

For further details regarding PowdermatriX, tel: + 44 (0) 1782 764444, e-mail: powdermatrix@ceram.com, website: www.powdermatrix.org.