

Innovate your way to business recovery: #5 The Opportunities of Advanced Manufacturing

At a time when businesses across the globe are grappling with unprecedented challenges, we must all become more agile and innovative to minimise the potential impact of the unpredictable or indeed turn difficult circumstances to our advantage.

The adoption of new technologies and practices are vital for survival in a marketplace that now demands more flexible and responsive production systems and supply chains.

While a culture of innovation has been a necessity over the last few months - and will be critical to the competitiveness of businesses in all sectors going forward.

Get Smart

Smart manufacturing involves the co-ordinated use of a number of different technologies to integrate and automate manufacturing processes resulting in seismic improvements in manufacturing quality, time, cost and flexibility. Some believe it may ultimately give way to the “dark factory” – so called because it can run without human intervention **and** run with no lights on! However, even though dark factories are still a way away in the future , there can be some valuable gains along the way.

CASE STUDY

One company involved in developing automated robotic manufacturing solutions in an automotive environment implemented a number of projects aiming at increasing automation of the manufacturing process, introducing smart sensors to facilitate self-adjusting tooling, automated materials processing and automated materials handling. The result was reduced maintenance costs, improved productivity and reduced health & safety issues (from reduced human operator involvement).

All of the above project activities made the company eligible for R&D tax relief, and they were able to receive £137,500 in R&D tax relief over a three-year period.



We were totally stunned at the amount claimed, we really couldn't believe it. The tax benefit has since allowed us to reinvest the money, buy new machinery and hire 2 new people. What a great result!

| ROD WAH
| MANAGING DIRECTOR
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The additive manufacturing revolution

The impact of technology can be felt much more deeply in manufacturing than merely the integration of systems leading to automation. In the last ten years, we have seen exponential growth of interest in additive manufacturing and in the development and application of new materials. Together these technologies and forming processes are revolutionising the design and development of components and products.

Additive manufacturing, often referred to as 3D printing, refers to a number of different techniques each with their own distinct advantages and disadvantages: some of them laying down layers of material on a "drop on demand" basis (material jetting), others using ultrasonic welding to bond layer-by-layer ribbons of material (sheet lamination) and some even binding successive layers of powder using heat, to build a product (sintering).

Although these allow for faster development and proving of prototypes, in many instances the integrity and strength of finished structures is not sufficient for production of finished products. However, further research and development aimed at improving the effectiveness of adhesive substrates and curing processes could make additive manufacturing mainstream and generate new opportunities for make-to-order products.

CASE STUDY

One business involved in plastic injection moulding and working on reducing processing time and contamination for medical components, used 3D printing to improve the accuracy of its moulds. The company applied new vacuum casting processes, allowing it to reduce process times by 3% and contamination rates by 15%, which in turn reduced rework and waste.

As an added bonus, the above 3D printing project allowed the business to benefit from £76,500 in R&D tax relief over a three-year period.

The cost of cutting-edge materials

One area where these new forming processes are delivering ground-breaking advances is in the use of biomaterials for printing replacement human organs, to reduce the risk of rejection. This may also resolve the issue of scarcity of specific types of transplant organs.



And this brings us seamlessly to the final piece of the advanced manufacturing jigsaw, namely the application of new materials in manufacturing. At its simplest level this will include experimentation around how to most effectively incorporate new materials in a product to imbue it with specific properties such as weight or strength, or alternatively remaking products entirely from new materials.

For example, there is currently a considerable amount of research and development around the incorporation of graphene in products. While graphene is both very strong and flexible, it is also particularly expensive. The challenge is therefore to find the most cost-effective approach to imbue products with the strength of graphene, without making them prohibitively expensive: i.e. trying to incorporate graphene into running shoes in order to strengthen the soles, whilst still keeping them within the budget of the average runner.

Another example is the use of aluminium-lithium alloy in the manufacture of aircraft components. This new alloy offers improved stiffness, better corrosion resistance, improved fatigue strength and all with a significant weight saving on aircraft using traditional aluminium alloys or fibre composites.

We can help.

Securing the right funding for your innovation project is vital to its success and your continued investment in R&D. ABGI is here to help. We help our clients accelerate their innovation activities by identifying and securing the right innovation funding, through grants, tax incentives and commercial funding.

ABGI-UK can review your projects and identify the most appropriate forms of funding and assist in the application process, to support those projects from idea to market readiness and beyond .

WE CAN HELP YOU:

- Review your current funding.
- Identify opportunities – existing and new.
- Maximise your entitlement.
- Accelerate funding into your business.
- Be informed when new opportunities emerge.

Please contact ABGI on 0203 984 0321, or visit www.abgi-uk.com

About ABGI

ABGI is an international leading tax incentive and innovation management advisor. We help companies accelerate financial performance, innovation and business expansion by capitalising on their R&D and innovation activities, in compliance with all rules and regulations. **Whatever innovation funding challenges you face – in the UK or internationally – we can help.**