

High Value Manufacturing news
Issue 02

CATAPULT
High Value Manufacturing

HVM CONNECT



WELCOME TO HVM CONNECT

Your bi-monthly high value manufacturing update



Rosa Wilkinson
HVM Catapult
Communications
Director

Welcome to the second edition of HVM Connect. In retrospect, launching a newsletter at a moment when e-mail systems were under siege from multiple GDPR-related messages may not have been the ideal time, but I was delighted to receive so many positive comments and suggestions about our inaugural edition in April. Thank you to all who got in touch. We will continue to tweak the format and content so that HVM Connect delivers the news you want to read. My ears are always open to your ideas and suggestions.

One thing I pick up in the conversations I have with businesses, friends in universities and folk across Government, is that they don't always understand what the HVM Catapult does. In each of our coming editions we will try to explain that by profiling one of our Centres, starting with the Nuclear Advanced Manufacturing Research Centre. Against the backdrop of the Nuclear Sector Deal and increased activity across the sector, there's much to report.

Elsewhere in this edition, you'll find articles on how other HVM Catapult Centres are building their offer to support innovation and enhance the performance of companies across the UK. There's lots going on so it will be no surprise that our guest columnist, Gavin Lambert, the BEIS Director for Advanced Manufacturing, sees the work we do as core to his Department's agenda.

Enjoy this edition of HVM Connect.

CONTENTS

High Value Manufacturing Catapult celebrates award for Chief Executive	3
New Medicines Manufacturing Centre to strengthen UK pharma	3
Nuclear AMRC welcomes sector deal	3
Now is the time	4
Gavin Lambert talks UK Productivity	5
Helping Manufacturers to Innovate and Innovators to Manufacture	6
MTC to lead major aerospace supplier programme	6
AMRC leads the way in Collaborative Robotics research	7
MTC and NCC Graduate get-together	7
In the Spotlight: Nuclear AMRC	8/9
Family-run vehicle conversion firm embraces Virtual Reality with the help of AMRC	10
AFRC forms partnership with Bitzlist to create smart factory for Scotland	10
Cycle time slashed for rough milling	10
Current Innovate UK funding opportunities	11
Case Studies	11
Dates for your diary	12
Work with us	12

Keep up to date

Get all the latest news from the HVM Catapult:

[@HVM_Catapult](#)

[linkedin.com/company/
high-value-manufacturing-catapult/](https://www.linkedin.com/company/high-value-manufacturing-catapult/)

www.hvm.catapult.org.uk



High Value Manufacturing Catapult celebrates award for Chief Executive

The High Value Manufacturing Catapult, which stimulates and supports the commercial application of new technologies through the development of innovative manufacturing processes, is pleased to announce that its Chief Executive, Dick Elsy, has been appointed Commander of the Most Excellent Order of the British Empire (CBE) in the Queen's Birthday Honours for 2018.

The award was given in recognition of Mr Elsy's services to Manufacturing and Technology.

Welcoming the Honour, Allan Cook CBE, Chair of the High Value Manufacturing Catapult said:

"Dick's recognition in this year's honours list will be celebrated by all in manufacturing. His tireless passion and enthusiasm for encouraging and supporting innovation in the sector, is helping to drive a transformation that will position UK companies to win in hugely competitive global markets".

For more information on the HVM Catapult Management Board [click here](#).

Nuclear AMRC welcomes sector deal

Industrial Strategy

Nuclear Sector Deal

The Nuclear AMRC has welcomed the launch of the nuclear sector deal, part of the UK government's industrial strategy.

Andrew Storer, chief executive officer of the Nuclear AMRC, says: "We welcome the nuclear sector deal, which represents a landmark agreement between government and industry to reduce costs and increase productivity across the UK nuclear sector.

"This deal will benefit manufacturers in all parts of the nuclear supply chain, and maximise the economic opportunity from clean growth. It will support innovation and technology transfer between sectors, helping companies increase their productivity and competitiveness, and reduce barriers to entry for manufacturers moving into nuclear from other sectors such as oil & gas or marine engineering.

New Medicines Manufacturing Centre to strengthen UK pharma

The UK's pharmaceutical and fine chemical industry is accelerating development of a new generation of manufacturing processes thanks to a new £56 million medicines manufacturing innovation facility.

The state-of-the-art Medicines Manufacturing Innovation Centre (MMIC) will be located in Renfrewshire, Scotland, and led by the Centre for Process Innovation (CPI) in partnership with the University of Strathclyde, the Medicines Manufacturing Industry Partnership (MMIP), and founding industry partners AstraZeneca and GSK.

With a collaborative innovation culture and state-of-the-art facilities, the new MMIC will develop highly efficient and effective technologies. As a flexible and adaptable building, the centre will

"Here at the Nuclear AMRC, we will have an important role to play in delivering the deal. We will work with our industry and research partners to demonstrate the benefits of advanced techniques and technologies for manufacturers of all sizes. We will also play a leading role in the new national programme to enhance the capabilities of the UK's supply chain, expanding our established Fit For Nuclear programme and building on the success of Civil Nuclear Sharing in Growth. The new £200 million nuclear sector deal is designed to secure the UK's diverse energy mix and drive down the costs of nuclear energy meaning cheaper energy bills for customers. It includes a £32 million boost from government and industry to kick-start a new advanced manufacturing programme, including R&D investment to develop potential world-leading nuclear technologies like advanced modular reactors, plus up to £30 million for a new national supply chain programme.

The deal also includes a commitment to increasing gender diversity with a target of 40 per cent women working in the civil nuclear sector by 2030.

Read the [Nuclear Sector Deal here](#).

enable industry, academia, healthcare providers and regulators to work collaboratively to address challenges along the medicines supply chain.

Enhancing the link between those doing research and development and those manufacturing drugs will reduce the risk in the process of adopting disruptive technologies and accelerate the translation of the UK's strong research base into new industrial approaches of the future.

Visit the CPI website [here](#).





Now is the time

“If we want to seize the future now is the time” said Science Minister Sam Gyimah in a recent piece for The Telegraph. He’s right, but to succeed we must raise our game when it comes to transforming the excellent output from the UK’s world-leading research community into the products and processes that will boost national productivity and deliver sustainable prosperity, its academics, innovators, businesses and Government need to work together. That’s why, at the end of 2017, the High Value Manufacturing (HVM) Catapult created the UK Manufacturing Forum as a safe space for all parties to debate priorities and drive progress.

A sunny day in May saw the second gathering of the Forum on the banks of the Thames at the IET. The HVM Catapult’s Comms Director, Rosa Wilkinson, opened proceedings with an overview of HVM Catapult’s five-year strategy and the delivery plan it had developed. The goal is to move towards an **innovation-led manufacturing sector**, with **world class capability** to bring the **best technology research** to market, making a growing contribution to the UK economy and supported by **access to innovation** insight, facilities and expertise provided by the HVM Catapult as the ‘**go to**’ place for advanced manufacturing technology.

The Forum welcomed presentations on the Industrial Strategy from the Business Department’s Clare and Katie Daniel who shared an overview of the new UK Research and Innovation (UKRI) strategy and an update on the Industrial Strategy Challenge Fund, alongside the range of UKRI initiatives currently live. Industrial perspective came from Mark Howard at Airbus who emphasised the need for research ideas to translate into innovation value if Airbus are going to deliver the Wing of Tomorrow strategy. Today, following Airbus comments on progress towards the UK’s EU exit, we all understand the importance of getting the industrial environment right for

such a key UK employer.

Research and Innovation is a key part of an enabling landscape as Sam Turner, the Catapult’s Chief Technology Officer made clear as he talked the audience through the HVM Catapult’s technology strategy. Outlining the HVM Catapult strategic objectives and technology investment plans, Professor Turner emphasised the importance of academic collaboration in developing both technology and sector roadmaps over the next twelve months where the focus will be on Digital, Metrology, Composites and Additive Manufacturing. The event encouraged academics to get involved in the upcoming road mapping activity and partake in the future planned events to shape the national manufacturing strategy collaboratively. If you feel you could play a part, e-mail questions@hvm.catapult.org.uk to register your interest in the four priority road mapping activities areas this year:

- Digital
- Metrology
- Additive
- Composites

The next annual UK Manufacturing Forum: from research to UK success will be held on 10th & 11th September at the Slate Conference Centre, University of Warwick, CV4 7SH.

[Register your interest here today!](#)

Gavin Lambert, Director of Advanced Manufacturing at the Department for Business, Energy and Industrial Strategy, talks UK Productivity



The UK can be proud of its manufacturing heritage. The government recognises the sector’s vital role in the economy: supporting 2.7 million jobs, contributing £188 billion GVA, 48% of UK exports, and accounting for 69% of business expenditure on UK R&D. Over the last 10 years, UK manufacturing productivity has increased over 4 times faster than the rest of the economy. It is home to world-leading sectors such as aerospace, pharmaceutical and automotive, with a new car rolling UK production lines every 19 seconds in 2017.

Given this success, it seems puzzling UK manufacturing productivity growth has flat-lined over the last 10 years, despite solid economic growth and improving labour market conditions. Although other developed nations have also faced this problem, UK productivity is still comparatively weak.

Productivity matters and the Government is determined to close the productivity gap. That’s why the Industrial Strategy focuses on how the UK can boost productivity and raise earning power for people throughout the country. We will do this by helping businesses create better, higher-paying jobs and

investing in skills and infrastructure across the nation.

We have set four Grand Challenges to put the UK at the forefront of future industries to address major global trends. The Prime Minister recently announced missions to support these. We have committed £1.7bn so far for the Industrial Strategy Challenge Fund, to help tackle the biggest challenges facing industry and society and will be making further announcements later in the year.

However, there is more to manufacturing productivity than just infrastructure and research; it is about commercialising and adopting new technology and having the right technical and leadership skills to manage change.

This is why we are supporting Made Smarter, an independent industry-led review setting out how the UK can lead in the fourth industrial revolution. Over 10 years, adoption of digital technologies could boost UK manufacturing by £455bn, increase sector growth by up to 3% per year, create a net gain of 175,000 jobs and reduce CO2 emissions by 4.5% - a huge opportunity to transform industry, society and boost productivity.

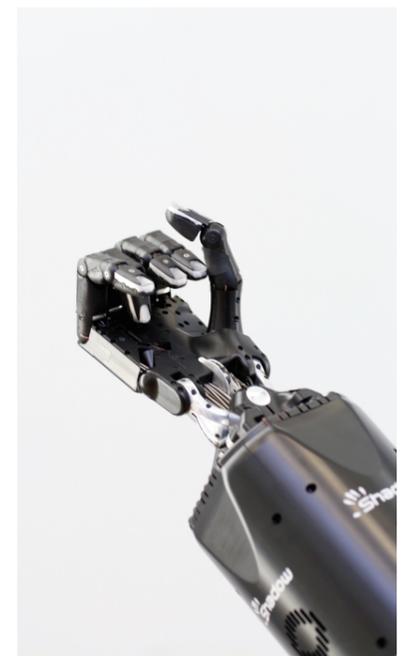
To kick-start this initiative, the Chancellor recently announced £20m for a new pilot in the North West of England to help up to 3,000 manufacturing SMEs to adopt and exploit digital technology. We will continue to explore how we can implement findings, including leveraging support from the High Value Manufacturing Catapult.

The Industrial Strategy will examine management skills through our “Long Tail Review”. This review looks to understand why UK firms are less

productive than our international counterparts.

We also recognise the value of stronger and more efficient supply chains in driving productivity, inward investment, exports and job creation. We want to create the right conditions for effective and thriving supply chains and so are considering evidence for what might be needed to strengthen all UK manufacturing supply chains and improve the offer to potential investors.

There is much more that we are doing through our Industrial Strategy and we continue to work in partnership with industry, academia and civil society to create a more productive economy that works for everyone, helping to inject confidence for a flourishing British manufacturing sector.





KTN: Helping Manufacturers to Innovate and Innovators to Manufacture

There has been a lot of talk about the UK's productivity gap. Raising productivity is one of the government's key priorities, forming a central part of the industrial strategy.

In May 2018 BEIS launched the [business productivity review](#). This call for evidence which is now closed was used to understand what firm-level actions could be most effective in improving the productivity and growth of small and medium-sized businesses. This review focused on businesses with lower productivity, sometimes described as a 'long tail' that lags behind the leading firms and underperform relative to domestic and international benchmarks.

Some would say that there is no coincidence that in July 2018 the Government launched [Business Basics: Boosting SME Productivity](#) a new fund to support small business growth.

'Put simply, UK businesses must do more to improve their productivity to get themselves match fit to compete globally in the years ahead. Low uptake of the nuts and bolts technologies of today is a key feature of the productivity puzzle that can, and must, be tackled.' Matthew Fell, CBI UK Chief Policy Director

The Fourth Industrial Revolution, 4IR, Industry 4.0, Industrial Digitalisation, Digital Manufacturing (the list of names goes on) is seen to play a key role in improving productivity across the UK. However when people mention these words do you know what they really mean? Surely cost is a barrier for these long tail businesses?

"It isn't about finding pieces of a puzzle it's about creating and putting those exceptional pieces together" - Glenn Van Deken

With this in mind should manufacturers be looking to innovation as part of the solution to improving productivity?

We know from experience that innovation doesn't always have to be time consuming or expensive. There are inexpensive, innovative solutions that can be used to monitor traditional manufacturing equipment, combining the use of low cost computing power with sensor technology. For a manufacturer with traditional machinery this is revolutionary and make Industry 4.0 more accessible than ever.

So if you are sat reading this with your own productivity or dare we say innovation challenges and not really sure, the good news is that there is help out there (and also lots of things you can read about the topic) across the UK.

There is no denying that productivity is an issue, and that when implemented well, digital technologies can play a key role. We know the landscape is confusing and it's difficult to know where to start and identify what support is out there.

The Knowledge Transfer Network's [manufacturing team](#) is here to help manufacturers innovate their processes and products to drive growth and productivity. Working to inform, simplify, connect, signpost to funding and support. We have developed [4Manufacturing@](#) a diagnostic tool focused on helping manufacturers accelerate the adoption of digital technologies to drive innovation and improved productivity. If you are interested in finding out more please [get in touch](#).

Innovate UK
Knowledge Transfer Network

MTC to lead major aerospace supplier programme

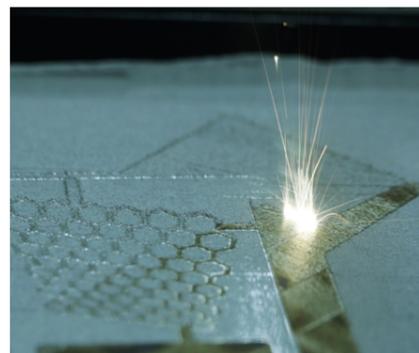


The Manufacturing Technology Centre (MTC), the High Value Manufacturing Catapult's Coventry-based centre, is to lead a £15 million programme aimed at encouraging suppliers to the UK aerospace industry to adopt additive manufacturing.

Additive manufacturing, or 3D printing, is employed across many manufacturing sectors in a variety of materials, producing everything from simple tools to major parts for aero engines. The MTC houses the National Centre for Additive Manufacturing (NCAM) bringing together the most comprehensive combination of equipment and capability in the UK. The MTC will lead the DRAMA programme.

The DRAMA (Digital Reconfigurable Additive Manufacturing for Aerospace) project is intended to encourage the UK aerospace industry's supply chain to adopt additive manufacturing technologies, which are increasingly being demanded by the country's prime aerospace manufacturers. Suppliers will be able to test products and processes in a virtual additive manufacturing facility at the MTC, and then transfer the work to the latest physical machines. During the project a full trial facility will open at NCAM, with proving facilities also available at Renishaw in Stone, Staffordshire.

[Click here to read more about the DRAMA programme.](#)



AMRC leads the way in Collaborative Robotics research to help SMEs transform into factories of the future

Engineers at the Advanced Manufacturing Research Centre (AMRC) are leading the way in Collaborative Robotics research in a drive to help SMEs integrate the technology onto factory floors.

Collaborative robots – also known as cobots – differ from conventional industrial robots in that they feature technology that allows them to operate safely alongside human workers in a shared area. They are capable of operating with limited force and speed and are equipped with force-sensing to enable them to stop when they come into contact with an operator.

Traditionally, the safe use of robots in manufacturing has relied on barriers, cages and fences to keep humans and robots separated. The downside to this is that it uses lots of floor space and limits the work robots and humans can do together.

Phil Kitchen has been leading on a Catapult-funded Collaborative Robotics research project for the Integrated Manufacturing Group at the AMRC's Factory 2050, developing technology demonstrators for industrial partners to show how humans and robots can work safely together and testing a new safety standard awaiting ratification for different types of cobots.

The project began in May 2017 and completed March 2018 with the aim of developing a gold standard in cobot safety that could increase confidence among SMEs to integrate the technology onto their factory floors and transform production lines by increasing the rate at which a process is done, as well as the uniformity and quality of finish on a product. The main driver for companies getting involved with cobots research now is to ensure they are not

left behind when the technology becomes common place on factory floors of the future.



MTC and NCC Graduate get-together

Unless you happen to be working on a collaborative cross-Catapult research project, meeting graduates from other HVM Catapult centres is rare. That is why a group of graduate research engineers from the National Composites Centre (NCC) in Bristol, and the Manufacturing Technology Centre (MTC) in Coventry, decided to meet together and visit each other's Catapult centre. The NCC and MTC graduates took it in turns to host a visit for each other; this included a site tour, learning about project work the graduates were involved in, and of course lunch.

As graduates within our own Catapult centres, we had a lot in common, so I found it useful to share our own experiences and learn what projects the MTC graduates were involved. The visit was also a great excuse to have

a tour around the MTC site and see their facilities and equipment. The whole visit gave me a greater appreciation of the MTC's purpose, especially being relatively new to the HVM Catapult. It brought to mind how easy it was to become inward looking within our own Catapult centres, forgetting about the diverse skills and areas of expertise held within the HVM Catapult network. When the MTC graduates visited then NCC, I am sure this sentiment was shared.

Being at similar stages in our careers, meeting each other was a great networking opportunity to chat about future career aspirations and develop relationships between graduates from another Catapult centre. I hope that as we develop as graduate engineers in our own Catapult centres, visits like this will build a foundation for collaboration

within the HVM Catapult, creating opportunities to develop the technology of tomorrow, together.

- Joshua Wood, Graduate Research Engineer, National Composites Centre.



In the Spotlight: Nuclear AMRC

Uniquely among the seven centres that make up the High Value Manufacturing Catapult, the Nuclear AMRC bears the name of a single industry sector.

The UK's civil nuclear industry currently employs some 65,000 people along the supply chain, and contributes around £6.4 billion to GDP – as much as aerospace manufacturing. The sector is set to grow as energy companies plan to build 18GW of new nuclear power generation at six sites around England and Wales, investing at least £70 billion to replace current plants which generate around a quarter of UK electricity.

Beyond that, by some estimates the UK will need another 50GW of low-carbon generation as electricity replaces fossil fuels for the transport and heating needs of a growing population. That means fantastic long-term opportunities for manufacturers which can meet the sector's requirements.

Nuclear power presents some of the biggest challenges in engineering, as well as some uniquely stringent requirements for suppliers. Its particular demands are recognised in the nuclear sector deal, published in late June as part of the government's industrial strategy.

The Nuclear AMRC will take a key role in delivering the deal's £32 million advanced manufacturing programme, working with industry and research partners to demonstrate the benefits of advanced techniques and technologies.

The centre will also play a leading role in the proposed £30 million national programme to enhance the capabilities of the UK's supply chain, building on the success of its established programmes such as Fit For Nuclear (F4N).

Fulfilling the Nuclear AMRC's mission of helping UK manufacturers win work in nuclear and adjacent sectors means putting as much emphasis on supply chain development as on manufacturing innovation

Supply chain impact

More than 140 UK manufacturers, mostly SMEs, have now been granted F4N status after driving improvements through the Nuclear AMRC's flagship supplier development service. F4N lets UK manufacturers measure their operations against the standards required to supply the nuclear industry, and take the necessary steps to close any gaps and reach the next level of performance.

More than 850 companies – representing some 410,000 employees and £24 billion of turnover – have started their F4N journey by taking the initial nuclear capability questionnaire. The journey to granting typically takes 12–18 months and demands commitment and drive from senior managers, but the Nuclear AMRC team supports companies through every step.

Many participating companies have won new work thanks to F4N, but new entrants to the nuclear supply chain say they still face significant obstacles to winning work – not least in connecting with potential buyers.

The Nuclear AMRC is now providing additional targeted support to companies after F4N granting, to help them identify opportunities in the nuclear sector and win tenders. To add even more value, the centre is also drawing on the lessons of one of its largest projects to date – Civil Nuclear Sharing in Growth (CNSIG), a major programme of supplier development and industry-led R&D backed by £37 million from the Regional Growth Fund.

Led by the Nuclear AMRC and Rolls-Royce, CNSIG included a four-year programme of intensive supplier development for some of the UK's key nuclear manufacturers. Eight companies completed a four-year programme of business development and training over 2014–17, tailored to the specific needs of their business.

CNSIG continues to make a sustained impact – to the end of March 2018, the participating companies reported that CNSIG has helped them secure £529 million of orders.



Delivering innovation

Linking manufacturing R&D to supply chain development is vital to ensure that manufacturers of all sizes can access innovative technologies, and have the business capabilities to successfully put them into production.

The Nuclear AMRC is working with an ever-growing number of companies to overcome their manufacturing problems and develop new technical capabilities. Its research factory in South Yorkshire is home to some of the largest and most powerful machining centres, welding cells and inspection facilities in the HVMC network – and, in some cases, the largest available for industrial research anywhere in the world.

In one recent collaboration with Sheffield Forgemasters into milling techniques for large nuclear forgings, funded by Innovate UK, the Nuclear AMRC's machining team reduced cycle time by 41 per cent. That could save weeks of work for a full-sized pressure vessel section – the kind of performance improvement which could give UK companies a global lead in manufacturing a proposed new generation of advanced modular reactors.

The nuclear sector deal included support for new reactor designs which, if developed in the UK, will give manufacturers the opportunity to exploit innovative manufacturing processes which aren't approved for the current generation of reactors. The Nuclear AMRC has positioned itself at the forefront of these new technology areas, and is working with all the major reactor vendors targeting UK development.

The centre is also expanding its technical scope to support even more companies in the nuclear sector. The Nuclear AMRC initially focused on tackling the mechanical engineering challenges of the UK's nuclear new build programme, but its mission doesn't stop at metals – the centre is now developing new capabilities in areas such as electrical controls and instrumentation (EC&I), equipment qualification (EQ) and modularisation.

Last summer, the Nuclear AMRC launched a dedicated modular manufacturing R&D facility at the Birkenhead site of member company Cammell Laird. Modularisation can significantly reduce construction risk for nuclear new build by doing more in a controlled factory environment, and less on a remote coastal construction site.

The Nuclear AMRC is now establishing another new facility in Derby to develop new capabilities in EC&I and EQ, and create flexible research space to tackle the manufacturing challenges facing companies across a range of high-value sectors. The new facility will also open up the centre's capabilities in large-scale manufacturing for the benefit of other industries, and draw on best practice and innovative technologies from those sectors to further enhance the UK nuclear supply chain.

The Nuclear AMRC may say Nuclear on the door, but its impact and mission go far beyond.

www.namrc.co.uk



NUCLEAR AMRC



Vehicle conversion firm plugs into Virtual Reality to boost production

A family-run vehicle conversion firm is embracing Virtual Reality technology to boost productivity and reduce turnaround times for designing and kitting out vehicles for customers.

A team from the Integrated Manufacturing Group (IMG) at our Sheffield-based centre, the Advanced Manufacturing Research Centre (AMRC) worked with Clarks Vehicle Conversions to show how it can use Virtual Reality (VR) to revolutionise the design stages of converting a vehicle.

Clarks Vehicle Conversions (CVC), based in Doncaster, kits out vehicles such as welfare vans, lifestyle vehicles and crew carriers to clients' individual specifications. Currently, when a job comes in for CVC, a skilled team of fitters, electricians, engineers, mechanics and designers has to build a physical prototype to show the customer.

This involves kitting out a van to the customer's exact requirements. The customer then has to visit the CVC's Conversion Centre to approve the van layout before it can go into production. If the customer wants to make changes it can push back delivery time as they have to revisit the Centre.

IMG Digital Software Engineer, Jake Senior, showed the company how established VR technology could be used to transform the design stage of a conversion by allowing the customer to wear a VR headset and 'build' a virtual prototype to their own specification – rather than having to wait for a practical demonstrator to be built, reducing the turnaround time between an order being placed and the vehicle leaving the shop floor.

Jake used the company's existing CAD models to recreate an empty van in the virtual world where the customer can pick items from a displayed bill of materials and place them in the van where they want them to go. The bill of materials also list the mass of each item selected, the installation time and cost – updating in real time whenever a new item is chosen.

The idea is the customer has full control over the design process which minimises the risk of them wanting to make changes down the line due to a wrong layout. It also means when the customer is happy with the fit out in the virtual world, the design can be rubber stamped and sent for manufacture.

The use of VR technology to help with design and prototyping slashed the 'order to manufacture' turnaround time from up to six weeks down to 30 minutes.

The packages of work by the IMG group were carried out during a five-day funded project that is part of the AMRC's commitment to SME engagement, funded by the High Value Manufacturing Catapult.

AFRC forms partnership with Bitzlist to create smart factory for Scotland

The University of Strathclyde's Advanced Forming Research Centre (AFRC) has agreed a tier one partnership with software platform BitzList – the first micro business to sign a top-level agreement with a High Value Manufacturing Catapult organisation.

Working in collaboration, the AFRC and BitzList are developing a technological platform for the creation of a smart factory – an environment where machinery and equipment are able to improve processes through automation and self-optimisation using a constant stream of data from connected operations.

Through the partnership, BitzList will give the AFRC access to specialist industry 4.0 software it has been working on for over 15 years, designed to provide manufacturing and engineering firms with the tools needed to organise day-to-day operations and for parts suppliers to streamline supply chains.

Cycle time slashed for rough milling

Nuclear AMRC researchers used a range of advanced techniques to cut the time for rough milling a large nuclear forging by more than 40 per cent.

The research was part of a major investigation into innovative forging and fabrication solutions for the energy sector, led by Sheffield Forgemasters with funding from Innovate UK, the UK's innovation agency.

Rough milling a large forged component such as a pressure vessel section can take hundreds of hours, even without the time required for set-up, movement and inspection. Reducing that time, while ensuring economic tool life and avoiding any additional manufacturing risks, can significantly increase productivity for parts with relatively high production volumes, such as components for new designs of small modular reactor (SMR).

The project focused on a large forged component

representing a section of a dome, made of a low-alloy SA508 steel widely used in pressure vessels, with extensive cutting trials on the Nuclear AMRC's Soraluec FX12000 horizontal milling machine.

After all the analysis and modelling, cutting trials on the selected toolpaths confirmed the predicted tool life and proved that cycle time for rough milling could be reduced by 41 per cent – potentially saving weeks of work for a full-sized pressure vessel section.

The team are now preparing a final showpiece using the techniques developed during the project, and aim to extend the research into finish machining.

The project was part of a major investigation supported by funding from Innovate UK. The £4 million, 33-month project led by Sheffield Forgemasters aims to reduce the cost, lead time and embodied energy of large forgings.

[Read more here.](#)

Current Innovate UK funding opportunities

Innovation loans: July 2018 open competition

Registration closes: Wednesday 29th August 2018 12:00pm

Loans for game-changing innovations with strong commercial potential that will significantly improve the UK economy.

Innovate UK is to offer up to £10 million in loans to micro, small and medium-sized enterprises (SMEs). Loans are for highly innovative late stage projects with the best game changing and/or disruptive ideas or concepts. There should be a clear route to commercialisation and economic impact.

[To find out more about the July 2018 open competition, click here.](#)

[Click here to see Innovate UK's current funding opportunities.](#)

Innovate UK

Join the Manufacturing Technology Centre (MTC) on 29 & 30 October for Digitalising Manufacturing 2018

The MTC's flagship two-day conference returns this autumn, covering everything from policy, UK and international perspectives, talent and society to the more practical aspects of how you can introduce digital manufacturing technologies into your own business.

Confirmed speakers include: Professor Juergen Maier, Siemens Plc, Marcus Burton Yamazaki Mazak and Dr Steven Barr, Hennik Edge.

[Click here to find out more and register.](#)

SME's are being offered 50% off the ticket price – email digital@the-mtc.org and you will be sent a discount code.

The HVM Catapult has a wealth of quantitative and qualitative data on the impact it is having on the companies we work with. Our case studies give a good impression of the value we have added to many companies across all sizes and all sectors. Maybe we could help your business? There is a cost involved, but we can signpost sources of funding, for example, through Innovate UK. Email us at info@hvm.catapult.org.uk if you'd like more information or to discuss working with us.

WMG's SME team and Pashley Cycles

"It is an enthusiastic and professional support that a company like ours needs, and we have received this from the WMG SME Team" Adrian Williams, Managing Director, Pashley Cycles Ltd

Pashley Cycles is England's longest established bicycle manufacturer. Founded in 1926 and based in Stratford-upon-Avon, its dedicated team design and hand-build a unique range of traditional bicycles and tricycles.

Although a traditional brand, Pashley realised that to continue to grow and develop they must innovate. They had two separate challenges when they initially met with WMG's SME team. The first was the ability to apply decorative finishes and bespoke imagery to metal and plastic parts on their cycles for some upcoming limited edition products. The second was around developing the customer experience associated with their high profile brand across their distributor network, sales process, website, and social media presence.

WMG has expertise in both materials technology and user insights, and so two different projects were set up to support Pashley Cycles with their exciting plans.

Time was spent defining the 'Personas' of key customer groups that Pashley supply to and would like to engage with. WMG conducted a workshop where the customer journey was mapped out with the Pashley team, and key 'touchpoints' were identified where Pashley could potentially engage with their customers more effectively.

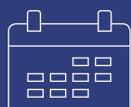
WMG and Pashley also worked together to identify what key activities could be implemented to ensure that the Pashley brand and customer experience is mirrored across different distributor organisations.

In order to apply decorative finishes to the cycles WMG proposed to trial the process of dye sublimation, a process developed and optimised at WMG at the University of Warwick. WMG are currently undertaking trials on a Pashley mudguard to test if the geometry will work using this process, and also on a white part to test if the colour reproduction will be effective using dye sublimation. They will then spend time with Pashley explaining what different finishes and coatings can be used and make recommendations for how they could use the process going forward.

So far, a number of new ideas have arisen that Pashley can start to work on to build on the experiences that their potential customers have when buying a cycle. New opportunities have been identified which could significantly grow Pashley's customer and distributor base. Through the work, five jobs have been safeguarded in the business.

[For more success stories from the WMG SME team, click here.](#)





Dates for your diary

Focus on Metrology: The scale of possibilities for UK manufacturers

11th July 2018
AMTC, Coventry

Are you ready to discover new ways of thinking around metrology? Join us on the 11th July 2018 to discover the art of the possible in metrology - and how it can benefit manufacturers.

Farnborough Airshow 2018

16th July- 20th July 2018
Farnborough

The HVM Catapult will be exhibiting in the Aerospace 4.0 space at the Farnborough International Airshow 2018.

Low Carbon Vehicle Event 2018

12th September - 13th September 2018
Millbrook, Bedford

Come and see the HVM Catapult in Hall 3 at LCV 2018, the UK's premier low carbon vehicle event.

Digitalising Manufacturing Conference 2018

29th October - 30th October 2018
MTC, Coventry

This year, the MTC's Digitalising Manufacturing Conference will focus on impact and progress. One year on from Prof. Juergen Maier's launch of the Made Smarter Review at last year's conference, where do we stand and what has changed?

WORK WITH US

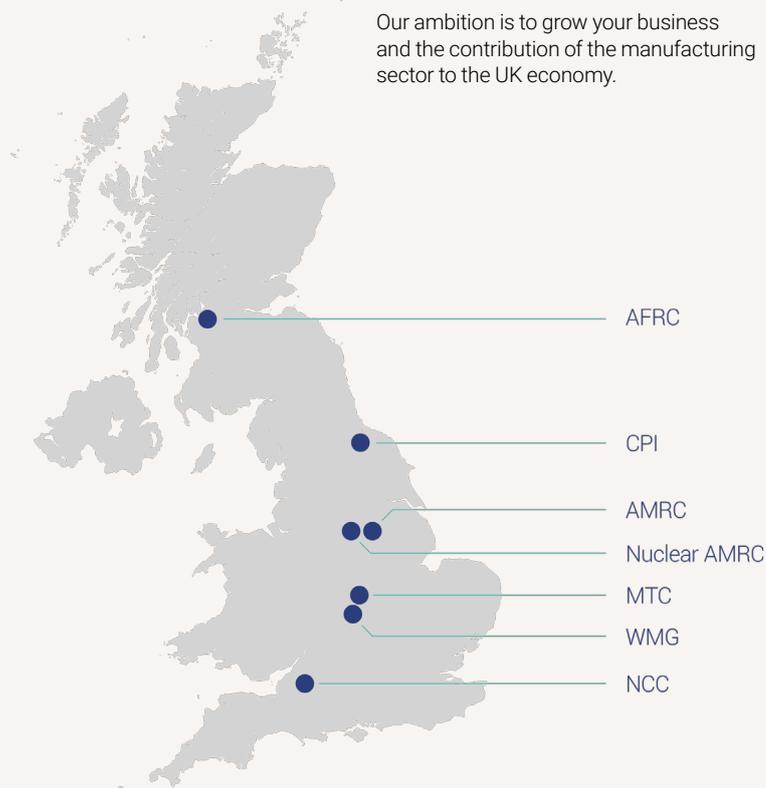
The High Value Manufacturing (HVM) Catapult is here to help UK businesses of all sizes accelerate new concepts to commercial reality.

Working through seven world-class centres of industrial innovation, we provide access to the specialist equipment and expertise you need to help investigate new technologies and processes and test their application. We can also help you to improve existing processes. We're here to help you strip away the risks of innovation and make investment decisions when you are confident that an idea can be scaled up to deliver on a commercial scale.

Our services are available to firms of all shapes and sizes, from FTSE-listed companies to SMEs deep in the supply chain. They include:

- Capability which spans from basic raw materials through to high integrity product assembly processes
- World-class facilities and skills to scale-up and prove high value manufacturing processes
- A network of leading suppliers who contribute to key UK industry supply chains
- A partnership between industry, government and research in a shared goal to make the UK an attractive place to invest in manufacturing

Our ambition is to grow your business and the contribution of the manufacturing sector to the UK economy.



For more information or to discuss working with the HVM Catapult, please contact:

Email: info@hvm.catapult.org.uk

Telephone: +44 (0) 1564 711 540

HVM Catapult
Regus Building
Blythe Valley Park
Shirley
Solihull
B90 8AG