

Grace Forge Sculptures

Cumbrian blacksmith forges ahead after digital boost

A Cumbrian blacksmith is using digital technology to cut waste, boost productivity and scale her growing business, backed by Made Smarter.

Ellie Barden, founder of Penrith-based Grace Forge Sculptures Ltd (Grace Forge), manufactures bespoke gates, railings, architectural metalwork and large-scale public sculpture.

To modernise processes and support her growth plans, the business is investing in CAD software, 3D scanning, rapid prototyping and large-format plotting.

The move is forecast to reduce material waste by up to 50 percent, cut rework time, strengthen client confidence and position the business for larger public-sector and architectural commissions.

Ellie said: *"Working with Made Smarter has been a really positive experience for us. When you're still mid-journey as a small business, having that kind of structured support and encouragement makes a real difference. The team genuinely understood what we were trying to achieve and helped translate that into a clear, practical roadmap. It's not just the funding, it's the confidence and direction that comes with it."*

The Challenge

After beginning her career in farriery, Ellie discovered a passion for forging during her apprenticeship. In 2018, she founded Grace Forge and developed a strong reputation for quality and artistic integrity, securing three major public art commissions, including a five-metre steel sculpture of world-record Limousin bull Graiggoch Rambo, commissioned by Cumberland Council

While the projects raised the company's profile, they also highlighted weaknesses in how the business operated. Designs were drawn on paper, measurements taken by hand, and prototypes developed through trial and error. This traditional

approach suited the craft, but as projects became larger and more complex, it reduced accuracy, slowed approvals and led to unnecessary material waste.

Ellie said: *"I knew we couldn't keep operating in the same way without investing in digital tools. If we wanted to take on larger architectural and public-sector work properly, we needed more precision, more efficiency and a more professional way of presenting our designs."*

The Solution

Ellie was introduced to Made Smarter through a business advisor at the Cumbria Growth Hub.

She undertook a Digital Transformation Workshop with advisor Sarah Woodhams, creating a clear digital roadmap for the business and identifying where technology could strengthen existing craft processes without replacing hands-on fabrication.

With Made Smarter grant support, Grace Forge invested in CAD software, a high-performance laptop, a 3D scanner, a high-speed 3D printer and a large-format plotter.

CAD now enables accurate 3D design, digital collaboration with clients and drawings produced to scale. The large-format plotter allows full-scale templates to be created in-house, improving workshop precision.

The addition of 3D scanning enables precise measurement of real-world components, particularly valuable for bespoke and heritage installations. Meanwhile, 3D printing allows rapid prototyping of sculptures and architectural elements, helping clients visualise scale and form before fabrication begins.

The Benefits

Replacing paper sketches with scaled digital drawings has improved accuracy in material calculations and reduced errors before fabrication begins.

Ellie forecasts a 30 to 50 percent reduction in material waste as steel ordering becomes more precise. Rework is expected to fall by 15 to 20 percent due to improved design accuracy and digital scanning.

Faster prototyping cycles reduce the time between concept and client approval. Physical scale models can now be produced quickly, shortening decision-making times and improving project flow.

The ability to present digital designs during early-stage discussions has increased client confidence and improved conversion rates, particularly for higher-value commissions. Accurate scaled drawings also improve pricing precision, strengthening financial control and reducing risk.

The environmental impact is clear. Wasting less steel means reducing emissions. Fewer offcuts reduce scrap handling and transport, decreasing vehicle movements and energy use. In-house large-format plotting reduces reliance on external suppliers, limiting delivery miles and associated transport emissions. And more accurate first-time fabrication avoids rework, preventing unnecessary energy consumption on corrections and remanufacture.

Digital capability means the business is now better positioned to compete for council, trust and larger contracts. Overall, Ellie forecasts increased profitability over the next three years, creating capacity for further investment in staff and equipment.

“Working with Made Smarter has been a really positive experience for us.”

Ellie Barden
Founder



The Future

Grace Forge has recently transitioned from sole trader to limited company and is building the structure required for sustainable growth. Ellie now works alongside Forge Manager Sian Comerford, who supports organisational development while also training in metalwork.

The next phase focuses on embedding digital workflows and building internal capability in these technologies.

As capacity increases, Ellie plans to create apprenticeships and permanent skilled roles. Future

engagement with Made Smarter may include further support around skills development, leadership and additional technology investment.

"It's not about replacing what I do by hand, it's about making better decisions before I start making," Ellie explained. "I want Grace Forge to be a healthy, supportive place to learn and work, and this is about building the right foundations so we can grow properly."

